Attachment J.2 Technical Specifications

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ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials
ANSI	American National Standards Institute
DC	District of Columbia
DDOT	District Department of Transportation
ICC	International Code Council
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
NEC	National Electrical Code (NEC) – Latest Edition
NEMA	National Electrical Manufacturers Association
USASI	United States of America Standards Institute
Pepco	Potomac Electric Power Company

C.5.1. SCOPE OF WORK

Work under this contract will consist of Civil Construction for DC PLUG Feeder No. 308 located in Ward 3. The scope of work will address, but not limited to, the following major improvements:

(A) The removal and disposal of existing roadway pavement, curb, gutter, sidewalks, and trees, and milling of existing asphalt pavement to the extents shown on plans.

(B) The installation of Pepco supplied materials such as PVC and fiberglass conduits, precast manholes, precast tapholes, transformer wells, transformer pads, and other related items and components.

(C) The furnishing and installation of concrete for ductbank encasement.

(D) The furnishing and installation of thermal fill for ductbank encasement at transmission feeder crossings.

(E) The furnishing and installation of concrete and reinforcing steel for cast-in-place manhole construction.

(F) Excavation and backfilling of all utility cuts.

(G) Temporary patching of all utility cuts.

(H) Permanent patching and repair of all utility cuts.

(I) Restoration of all pavement markings disturbed by the utility cut and pavement patching work.

(J) Pavement profiling (milling) and overlay of utility cuts in accordance with DDOT standards.

(K) Installation of topsoil, seed, and mulch on all disturbed earth and grass areas.

(L) Installation of replacement curb (any type), curb and gutter (any type), and sidewalk (any type) sections.

(M) The installation and use of erosion and sediment control measures as required.

(N) Dust control during pavement sawcutting and excavation operation.

(O) Mobilization and demobilization, performance of field layout, provision and maintenance of engineer's field facilities, progress photographs, rodent control, and the proper maintenance of vehicular and pedestrian traffic during construction, including provision of all required construction warning and detour signs and traffic control devices.

Work also includes all incidentals needed to complete the project as shown on the Contract plans, and described in the Specifications and these Project Specifications or as directed by the Engineer.

C.5.2. RODENT CONTROL

(A) **GENERAL** - The Contractor shall take the necessary steps to insure that the project site, including all project-related facilities within the site, is free of rodent infestation at all times. Work includes, but is not limited to, the following:

1. Daily removal of and proper disposal of all refuse. In the event that refuse cannot be removed from the project site the same day, the refuse shall be stored in containers designed to prevent infiltration by rodents.

2. Inspections at least once a week throughout the project site for possible rodent infestations. If such infestations are found, the contractor and retain such service until infestation is no longer apparent.

3. Other approved measures that may be required for rodent control.

(B) **MEASURE AND PAYMENT**- No separate measure and payment will be made for **Rodent Control**. Costs for **Rodent Control** will be distributed among the various pay items.

C.5.3. UTILITY STATUS

The Contractor shall be required to maintain coordination with the public utility companies throughout the construction of the project. Construction delays as a result of inadequate coordination shall be the Contractor's responsibility.

No utility company work outside the scope of the project is anticipated. However, it will be necessary for utility companies to perform work during construction related to the contract work being performed. Such work consists of inspection of furnished materials and utility supports installed by the Contractor and being present during any demolition or concrete placement in the vicinity of their facilities.

The Contractor's involvement and coordination with utility companies includes, but is not restricted to, the following:

(A) Adjustment and resetting of utility manholes and manhole frames respectively to new grades. Location and verification of existing utility lines (as shown on the plans).

(B) Maintenance, protection and assurance of continuous service for the duration of the project of utility company facilities within the project limits.

The Contractor shall not proceed with work until utility facilities involved have been located, disconnected or otherwise adjusted by utility representatives.

C.5.4. WORK SEQUENCE

A phasing plan has been provided in the contract plans. The contractor shall organize his activities so that the civil construction work for Feeder 308 gets completed in the following order to meet Pepco's needs:

1. (Section 1) Sequencing of Work outlined in WR No. 3442306, Dwg. Sheets C-4 through C-6, C-11 and C-12

2. (Section 2) Sequencing of Work outlined in WR No. 3476905, Dwg. Sheets C-13 through C-19

3. (Section 3) Sequencing of Work outlined in WR No. 3476906, Dwg. Sheets C-7 through C-10

4. (Section 4) Sequencing of Work outlined in WR No. 3476916, Dwg. Sheets C-20 and C-21

5. (Section 5) Sequencing of Work outlined in WR No. 3476917, Dwg. Sheets C-22 through C-24

6. (Section 6) Sequencing of Work outlined in WR No. 3476919, Dwg. Sheets C-25 through C-27

7. (Section 7) Sequencing of Work outlined in WR No. 3476920, Dwg. Sheets C-28 through C-32

The contractor is not prohibited from working simultaneously in all sections of the project at any one time. Completion of the work in the designated priorities is required to facilitate Pepco's cabling operation which will be done under another contract upon completion and acceptance of the civil construction work for each section.

C.5.5. PEPCO FURNISHED MATERIALS

Materials to be furnished by Pepco shall be picked up by the contractor from Pepco's Benning Road Stores, located at 3400 Benning Road, NE, Washington, DC. Procedures for reserving, pickup, and return of excess materials will be provided by Pepco upon award of the contract. Example material requisition forms to be supplied by Pepco and used by the Contractor are included in the appendix.

For precast items, the Contractor shall provide a point of contact to be responsible for coordinating the delivery of those items from a Pepco supplier directly to the project site.

C.5.6. OPTIONAL MATERIALS

The District will not consider any alternate to the following items:

- Pepco furnished PVC conduit
- Pepco furnished fiberglass conduit
- Pepco furnished precast manholes
- Pepco furnished precast tapholes
- Pepco furnished precast well casings
- Pepco furnished precast transformer pads
- Other Pepco furnished materials and components

For all other contractor furnished materials or items, an optional equivalent will be permitted by the accepted bidder only, provided this alternate meets in all respects the requirements of the pertinent ASTM, AASHTO, District of Columbia, Pepco, or Federal Specifications and results in no additional cost to the District nor additional Contract time. The proposal for an equivalent item shall be submitted for review by the District immediately after bids have been opened in order that approval or rejection can be determined.

C.5.7. WORK AND STORAGE SPACE

This project Specification modifies Section 103.01, Article 17B of Standard Contract Provisions.

No work and storage space is being designated within the projects limits. The Contractor shall be fully responsible for seeking necessary space and undergoing all required negotiations and permits with adjacent property owners to secure a suitable work and storage space, and restoring the area to its original condition and to the satisfaction of the Engineer.

C.5.8. UTILITIES AND VAULTS

The requirements of Section **103.01 Article 17E** of the Standard Contract Provisions apply.

C.5.9. MAINTENANCE OF HIGHWAY TRAFFIC, Item 612 002 and Item 612 013

This project specification supplements and modifies Section 104.02.

See the approved Maintenance of Traffic Plans that were specifically prepared for this project.

Supplementing first paragraph of Section 104.02, reference to the MUTCD shall be to the 2003 edition, with latest revisions or latest edition.

Traffic Flow Restrictions - First paragraph of 104.02(A) is modified as follows:

All traffic lanes shall be a minimum of 11’ – 0” wide, except as shown on the

plans.

Vehicular and pedestrian access to all properties shall be maintained at all times during construction. Residential on-street parking will be restricted within the construction zone. The construction work zone shall be protected with Temporary Pedestrian PVC Barricade with attenuators and safety drums as shown on the Contract Plans. The Contractor shall maintain proper construction signage during the construction period. The Contractor shall maintain access to existing driveways, residential and commercial entrances at all times.

(A) **Traffic Flow Restrictions** - The actual duration of construction shall be minimized to reduce exposure to potential hazards. The Contractor's operation shall present no interference to traffic during the peak traffic hours of 6:30 A.M. to 9:30 A.M. and 3:30 P.M. to 7:00 P.M., Monday thru Friday, except holidays. Weekend and holiday work requires DDOT approval.

(B) **Flaggers** - The Contractor shall furnish all necessary flaggers that may be required during the course of construction activities. It is the responsibility of the Contractor, utilities and agencies to ensure that trained personnel administer flagging. Flaggers shall be equipped with safety vests, 24" stop/slow paddles and helmets as per Section 6E of the MUTCD.

(C) **Traffic Control Devices** - Approved warning signs, channelizing drums, cones, arrow panels, etc. shall be provided to insure motorists of positive guidance in advance of and through the work zone. Erection of regulatory signs such as stop, speed limit and no parking signs must be specifically authorized. Advance Warning signs shall have face sheeting that shall be Fluorescent Orange High Performance Wide Angle Retroreflective material or equal. All temporary traffic control devices shall meet NCHRP-350 testing requirements. Note: Mesh roll-up signs are not approved. Sign Supports shall be of a spring-loaded type or equivalent. Tripod or A-frame sign stands are not approved.

The temporary signs and markings placed in or adjacent to the work zone shall be consistent and visible at all times. The existing signs and markings may be covered and/or removed temporarily if the intended functions of these signs and markings will not be applicable during construction. However, they shall be replaced promptly when work is completed. All temporary signs no longer applicable to the work zone shall be removed or turned away from traffic. The Contractor shall document all existing pavement markings and signage that is removed due to their work. The Contractor shall place temporary pavement markings at the end of each workday. DDOT-IPMA shall approve all temporary and permanent markings.

(D) **Pedestrian Safety** - The Contractor shall provide pedestrians with a minimum of 4' walkway. This walkway should be safe, convenient and replicate as nearly as possible the most desirable characteristics of

sidewalks or footpaths. Pedestrians should not be led into direct conflict with the work site operations or mainline traffic moving through or around the work site. All pedestrians including blind, hearing impaired and physically challenged need protection. All necessary signs and supports for closing sidewalks and detouring pedestrians shall be the contractor responsibility. Temporary ADA compliant handicap ramps and or protective walkways are also the responsibility of the contractor and shall not be paid for separately and cost shall be distributed among the various pay items.

(E) **Night Work** - During night time hours, the work site shall be made safe for traffic and installing electronically illuminated traffic control devices such as Flashing Arrow Panels and warning lights shall provide warning. These devices shall be used in conjunction with other traffic control devices, and their flashing sequence and light intensity shall meet the requirements cited in the MUTCD. All traffic control devices shall be reflectorized during night time hours.

(F) **Failure to Maintain Entire Project** - Failure on the part of Contractor, at any time to respond to the provision 104.02 and section 616, will result in the Engineer immediately notifying the Contractor to comply with required maintenance provisions. In the event that the Contractor fails to proceed with corrections to unsatisfactory maintenance so as to conform to the provisions of 104.02 and Section 616 within 4 hours after receipt of such notice, the Engineer may notify the Contractor to suspend all other work on the contract until such time that the unsatisfactory maintenance is corrected. In the event that the Contractor fails to respond to a notice of unsatisfactory maintenance within 4 hours after receipt of such notice, the Engineer will immediately proceed with adequate forces and equipment to maintain the project and the entire cost of this maintenance will be deducted from monies due the Contractor on the next monthly estimate.

An appropriate deduction will be made from Contractor's next Progress Estimate for each day, or portion thereof, that Maintenance of Traffic deficiencies exist and will continue until the deficiencies are corrected and accepted by the Engineer. Any portion of a day will be considered a full day deduction. The deduction will be equal to a pro rata share of the Contractor's lump sum price bid for Maintenance of Traffic or $ 200.00 per day, whichever is more. The amount prorated will be the per diem amount established by using the Calendar Days (based upon Calendar Dates when required) divided into the total value of the bid item. The amount of monies deducted will be a permanent deduction and will not be recoverable. Upon satisfactory correction of the deficiencies, payment of the Maintenance of Traffic lump sum item will resume.

In case sufficient funds are not available under the lump sum bid item for Maintenance of Traffic (104.02) the funds will be deducted from the contract value.

(G) **DC PLUG Project Signs -** The Contractor also shall be responsible for

installing and maintaining Pepco supplied DC PLUG portable type project signs at selected locations at each active work zone. DC PLUG signs shall be relocated or repositioned by the Contractor as the work progresses. The Contractor shall be responsible for providing bases/supports for the portable DC PLUG project signs. Typical sign size is 4'x4' and there will be a minimum of 6 signs required at each work area. The Contractor shall return the DC PLUG signs to Pepco at completion of the project.

(H) Measurement and Payment - The unit of measure for Maintenance of Highway Traffic will be pro rata per payment request. This payment is based on implementation of contract Maintenance of Highway Traffic plans or approved Traffic Control Plans submitted by the Contractor. No direct measure will be taken for a lane closure. The Contractor shall distribute the lane closure cost throughout other contract pay items. Payment for all traffic control devices such as flashing arrow panels, channelizing drums, cones, construction warning signs, detour signs, sign supports, pedestrian control signs, temporary pavement markings, flags, flaggers, warning lights, barricades, portable barriers, delineators, attenuators and all materials, tools, labor and equipment necessary to complete that item of work will be made at the contract **lump sum** price bid. Two separate lump sum payments will be made. One payment will be for Maintenance of Highway Traffic - Conduit and Manhole Construction (Item 612 002), and a second payment will be made for Maintenance of Highway Traffic - Right-of-Way Restoration (Item 612 013).

C.5.10. VALUE ENGINEERING CHANGE PROPOSALS

This project specification modifies Section 104.03.

Replace first paragraph of 104.03(A) with the following:

GENERAL - This contract allows the use of Value Engineering Change Proposals (VECPs) which are initiated and developed by the Contractor to change the Contract Drawings and Specifications, or other requirements of this Contract for the purpose of reducing the total cost of construction without reducing design capacity or quality of the finished product.

C.5.11. WORK HOURS

This project specification supplements and modifies Sections 105.10 and 105.11.

Work may be performed outside of the following hours only when required by contract specifications or with the advanced notice to and approval by the Contracting Officer or the Contract Administrator:

Monday through Friday 7:00 AM to 7:00 PM – working behind Temporary Pedestrian PVC Barricade

Monday through Friday 9:30 AM to 3:30 PM – working behind Traffic Drums

No work that impacts the flow of traffic may be performed outside of 9:30 A.M. to 3:30 P.M. without the approval of DDOT. Work hours beyond these limits may be granted for only maintenance of traffic emergencies, work stipulated to be performed at night and other activities specifically granted in writing by the Engineer. The contractor shall meet all the requirements of night work as specified.

C.5.12. NIGHT WORK

This project specification modifies Section 105.11(A)

No night work can be permitted without prior written approval of the Chief Engineer, his designee as otherwise specified in the contracts documents.

C.5.13. PROJECT SECURITY:

(A) GENERAL - Portions of the general project site will be open to the public during construction. The Contractor shall take the necessary measures to prevent vandalism and theft of materials, equipment and tools as well as the completed work on the project site. The D.C. Department of Transportation shall not be held liable for any loss or damage resulting there from.

(B) MEASURE AND PAYMENT - No direct measure or payment will be made. The cost of project security shall be reflected, and distributed among the various contract Pay Items.

C.5.14. ADDITIONAL EQUIPMENT

This project specification supplements requirements of Section 106.02.

The Contractor shall provide the Project Engineer with supply containers and molds to obtain samples (specimen) for the duration of the contract.

Examples of containers and molds are cure boxes, molds for concrete cylinders, jars for tack coat sampling, labels and other miscellaneous supplies. The Project Engineer may request some special containers and molds at his discretion. The Office of Materials Development and Research Branch may request additional containers and molds.

The Contractor should schedule the delivery of these containers and molds to the Project Engineer to insure that this delivery will not disrupt the work in progress.

No measure and payment will be made. The cost of providing containers and molds shall be included in the unit price of the material sampled.

C.5.15. ADDITIONAL LABORATORY EQUIPMENT

This project specification supplements the requirements of Section 106.06

The Contractor shall also furnish, maintain and replace as necessary, the following equipment:

NO.	Description
6	Mold and Tamping Rod for testing the slump of plastic concrete, conforming to requirements of AASHTO T-119-82 (Slump of Portland Cement Concrete).
6	Pressure Pot for Air Entrainment Testing.

An independent laboratory shall properly calibrate the above air meters and their certification furnished to the Engineer.

All equipment included under this item shall remain the property of the Contractor at the end of the contract.

No separate measure will be made for this work. Payment for **Additional Laboratory Equipment** will be included under **Engineer's Field Facilities, Item 108 012**.

C.5.16. UTILITY PROTECTIVE ALERT

This project specification supplements and modifies Section 107.16.

On top of page 74, delete table above paragraph beginning "*GSA shall be ...." and replace with the following:

Traffic Signal System Facilities - The Contractor is forewarned that the utility drawings included in this contract are not guaranteed to be an accurate representation of actual field conditions. This is particularly true in the case of underground electrical conduits and manholes constructed throughout the city between 1985 and 1991 for traffic signal system communication cable. The contract plans for this project may have limited or no information of the placement, quantity or depth beneath the finished grade of such facilities.

The Contractor shall contact the Traffic Signal System Division at (202) 359-1478 before undertaking any excavation within the project limits to review drawings showing the location of these underground conduits and manholes. The Contractor is further forewarned to exercise extreme care when excavating in the vicinity of such facilities, since conduit depth and degree of protection may not be accurately represented on the plans. All direct and indirect damage to these facilities encountered during excavation shall be repaired at the Contractor's expense in accordance with the specifications of the Traffic Signal System Division. Such repairs may include conduit and manhole repairs and replacement of communications cable conduit which may extend far beyond the project limits.

NAME	TELEPHONE NO.	FACILITIES
"Miss Utility" for Wash Gas Light Co., Verizon, Pepco, AT&T	800-257-7777	Gas lines; telephone, electric and communication conduits and cables
DC Water	202-612-3400	Water mains and sewers
DDOT	202-497-3645 (day) 202-439-5046 (night) 202-359-5644 (alternate) 202-359-1478	Street lighting inspection Traffic signal systems
Washington Gas	703-750-1400 800-752-7520	Gas Lines
Pepco	1-877-737-2662	Underground and overhead electric lines

C.5.17. ENGINEER'S FIELD FACILITIES, Item 108 012

This project specification supplements the requirements of Section 108.05:

The Contractor shall provide and maintain a suitable field office within two blocks of the project site.

C.5.18. CONSTRUCTION COMPLETION TIME

This project specification supplements Section 108.08 (A).

The Contractor shall start work on the date specified in a written Notice to Proceed issued by the Contracting Officer, and shall complete the work within (240) consecutive calendar days after specified starting date. The District Department of Transportation will not allow partial suspension or time extension specifically due to inclement weather.

C.5.19. PRE-CONSTRUCTION SURVEY

This project specification replaces the first paragraph of Section 108.13 - PRECONSTRUCTION SURVEY with the following:

Prior to starting and after completion of any work, and during the progress of both concrete and asphalt operations, the contractor shall make a detailed inspection of buildings, structures, roadways, sidewalks, retaining walls, landscaping and related surface improvements adjacent to and in the vicinity of the proposed work, wherever located. The inspection shall include notes, measurements and digital recording, or any other approved method by the Engineer with audio soundtrack of all facilities. The audio description of the inspection shall include the date, time, weather conditions, address/stationing/location, brief description of the facility with contract name and number and description of physical conditions encountered.

C.5.20. EXISTING UTILITY SERVICE CONNECTIONS

The Contract Plans show existing utility service connections to houses, businesses, apartment buildings, and other facilities that were field designated as part of the surveying and utility locating work that was done for the project. Other utility service connections exist that must be located and test pitted prior to the installation of any new Pepco facilities.

Appendix C contains a list of all active water service connections within the project limits that was provided by DC Water.

Appendix D contains a list of all active gas service connections within the project limits that was provided by Washington Gas.

Both of these lists show service connections that may or may not have been picked up by the utility designation work. The Contractor is responsible for conducting test pits to determine the exact location of all service connections in the field.

Similar record information does not exist for sanitary sewer service connections.

C.5.21. RESTORATION OF SPEED HUMPS

Speed humps exist at several locations throughout the project area that will be disturbed by the Pepco facility construction work. Full restoration of the speed humps including pavement markings is required after the final patching and repaving is complete.

MEASUREMENT AND PAYMENT – No measure and payment shall be made and the cost for the restoration of speed humps shall be reflected and distributed among the various bid pay items.

C.5.22. ANTI-STRIP ADDITIVE - BITUMINOUS MIXTURE

(A) GENERAL – All bituminous mixtures shall include an anti-strip additive.

(B) MEASURE AND PAYMENT – No measure or payment will be made. Cost for **Anti-Strip Additive - Bituminous Mixtures** shall be included in the prices bid per ton of asphalt.

C.5.23. EXCAVATIONS AND RESTORATIONS (UTILITY LINES)

Replace Section 215.01 with the following:

The work performed in conjunction with the Pepco Facility Construction consists of subgrade replacement, surface course replacement, and pavement marking replacement for composite pavements, PCC pavements including bus pads, and flexible pavements. The work shall be performed by utility companies or their contractors and shall be subject to Chapter 34 of the Public Space Regulations (title 24, DCMR). In the event of any inconsistency with

another provision of these Specifications, the most stringent requirement shall govern.

Sawcutting and removal of paved areas for accomplishing the work shall be in accordance with Section 202.03, Hard Surface Pavement Excavation.

Pepco Facility Construction shall be in accordance with Project Specification C.5.37.

Excavation and Backfill for Pepco Facility Construction shall be in accordance with Project Specification C.5.36.

These specifications shall be used in conjunction with the Contract Drawings as well as the following DDOT Standard Drawings:

Drawing 207.01	Trench Repair Detail
Drawing 215.01	Pavement Restoration Utility Lines – 1
Drawing 215.02	Pavement Restoration Utility Lines – 2

The repair details included in the Standard Drawing noted above are further modified as follows:

(A) **Trench Repairs in Concrete Pavement** - Prior to placing the new concrete patch, the Contractor shall drill holes in the vertical face of the existing pavement and embed No. 4 steel dowel bars at 12" on-center spacing. Dowel bars shall be 18" long with a 6" minimum embedment length. Dowels shall be installed at the midpoint of the existing pavement thickness. All longitudinal and traverse edges of the pavement cut perimeter shall receive dowels.

(B) **Trench Repairs in Concrete Pavement with Asphalt Overlay** - Prior to placing the new concrete patch and subsequent asphalt overlay, the Contractor shall drill holes in the vertical face of the existing pavement and embed No. 4 steel dowel bars at 12" on-center spacing. Dowel bars shall be 18" long with a 6" minimum embedment length. Dowels shall be installed at the midpoint of the concrete base pavement thickness. All longitudinal and traverse edges of the pavement cut perimeter shall receive dowels.

(C) **Trench Repairs in Concrete Bus** Pads - Concrete bus pads that are sawcut for Pepco Facility Construction work shall be completely removed and replaced in-kind in their entirety. No patching of existing concrete bus pads will be allowed. Dowel bars shall also be installed along the perimeter of the existing bus pad when the adjacent pavement is concrete and/or concrete with asphalt overlay.

(D) **Trench Repairs in Concrete Alley Pavement** - Concrete alley pavement that is sawcut for Pepco Facility Construction work shall be completely removed and replaced in-kind in their entirety. No patching

of existing concrete alleys will be allowed. Dowel bars shall also be installed along the perimeter of existing concrete alleys where the adjacent pavement is concrete and/or concrete with asphalt overlay.

Replace Section 215.03(A) with the following:

A. PAVEMENT REMOVAL: The Contractor shall cut the full depth of the pavement to a neat line by means of a power saw in accordance with Standard Drawings 207.01 and 215.01.

Replace Section 215.03(B) with the following:

B. BACKFILL FOR TEMPORARY RIDING SURFACE: The Contractor shall backfill excavated areas with approved materials in accordance with Project Specification C.5.36. Backfill shall be placed and compacted in 6-inch lifts to within 4-inchs of grade.

The Contractor may use the flowable fill as backfill for Pepco Facility Construction. If this option is employed then the 6-inch shoulder described in 215.03(D) is not required, and the new base course described in 215.03(D) shall be anchored to the existing base on one side, as per the Standard Drawings.

Replace Section 215.04(A) with the following:

A. EXCAVATION AND BACKFILL FOR PEPCO FACILITY CONSTRUCTION: Excavation and Backfilling for Pepco Facility Construction shall be in accordance with Project Specification C.5.36.

Replace Section 215.05(A) with the following:

A. EXCAVATION AND BACKFILL FOR PEPCO FACILITY CONSTRUCTION: Excavation and Backfilling for Pepco Facility Construction shall be in accordance with Project Specification C.5.36.

Replace Section 215.09 with the following:

Aggregate base course, asphalt patching, temporary asphalt concrete, tack coat, pavement profiling (overlay), repair PCC, pavement base, alley, driveway, and alley entrances, pavement markings, and other similar items shall be measured and paid through the appropriate restoration item established under this contract.

C.5.24. HARD SURFACE PAVEMENT EXCAVATION

This project specification modifies and supplements Section 202.03 and applies to all excavation and Repair/Replace Items.

CONSTRUCTION METHODS (Saw Cutting) - During removal of existing roadways, sidewalks, curbs, gutters, alleys, driveways, concrete traffic barriers and wheelchair ramps, the portion to be removed shall be saw the full depth of the pavement or as directed and/or approved by the Engineer, such that the existing materials can be removed to a neat line with minimum damage to adjacent structures that are to remain in place. Any excessive damage done at these locations shall be repaired and restored by the Contractor at no cost to the District.

MEASURE AND PAYMENT - No measure and payment shall be made and the cost of saw cutting shall be reflected and distributed among the various bid pay items.

C.5.25. TEST PIT SPECIAL ITEM, Item 212 003

This project specification replaces Section 212.03 with the following:

Suitable excavated materials meeting requirements of Section 804.05 and density and moisture per Section 203.03(A) and (B) shall be used as directed for test pit backfill. Approved base materials shall be used in that portion of the excavation projecting through soils base layers.

Replace Section 212.04 with the following:

Test Pit Special Item will be required to determine the exact location and depth of existing utility lines including service connection laterals that are being crossed by Pepco Facility Construction.

Test Pit Special Item will be conducted as directed by the Engineer.

Test Pit Special Item will be performed on an Each basis.

Test Pit Special Item shall be scheduled as directed so that pit backfilling can be completed within the workday.

For test pits located in tree space or grass areas, all disturbed areas shall be restored to their original condition.

Replace Section 212.05 with the following:

The unit of measure for Test Pit Special Item will be Each.

Payment for Test Pit Special Item will be made at the Contract unit price per Each, which payment will include hand excavation as needed, backfill including borrow fill as needed, restoration including asphalt, concrete, and topsoil, seed and mulch as needed, and all labor, materials, tools, equipment, and incidentals needed to complete work specified.

C.5.26. TOLERANCE IN ASPHALT SURFACE

This Project Specification supplements Section 401.14

The Contractor shall constantly check the surface with a straightedge parallel to the center line while the pavement is being placed and rolled. Straight-edging and back-patching shall be done immediately after initial compaction and while the material is still workable.

C.5.27. HIGH EARLY STRENGTH PCC, Item 501 032

This project specification supplements Section 501.22

(A) GENERAL – if directed by the Engineer, it may be necessary to perform portions of proposed concrete construction with high early strength concrete. Work under this item consists of furnishing and incorporating high early strength Portland Cement, per Section 501.22, for obtaining high early strength concrete.

(B) MEASURE AND PAYMENT – The unit of measure will be **Cubic Yard**, which payment will include all labor, equipment, tools, materials and incidentals necessary to complete the work.

C.5.28. TEMPORARY FENCE FOR RENOVATING GRASS

(A) GENERAL – The requirements of Section 607.05 apply. Use DDOT standard material such as snow fence or other DDOT standard temporary fence material.

(B) MEASURE AND PAYMENT – No measurement and payment will be made for Temporary Fence for Renovating Grass. Payment for Temporary Fence for Renovating Grass will be included in the contract unit price for Renovating Grass, which payment will include all labor, tools, equipment, reseeding if necessary, to complete the work.

C.5.29. REMOVE TREE AND/OR STUMP, Items 608 002, 608 006, and 608 008

This project specification includes the following pay items:

- Remove Tree and Stump Up to 6 Inch Diameter, Item 608 002
- Remove Tree and Stump 12 to 28 Inch Diameter, Item 608 006
- Remove Tree and Stump 18 to 24 Inch Diameter, Item 608 008

This project specification supplements and modifies Section 608.01.

(A) GENERAL - The contractor shall furnish all labor, material and equipment necessary to completely and satisfactorily remove trees and stumps at various locations.

Whole trees and trunks shall not be dropped on the streets or sidewalks. When removal necessitates the use of a traffic lane, the

Contractor shall conform to the Manual of Uniform Traffic Control Devices, 2003.

Stump removal shall include the removal of all visible surface roots regardless of their distance from the main stump. The grinding method shall be used and exception to this requires written approval by the contract administrator/designee. Shavings must be removed within 24 hours after stump grinding operation. In the interim, shavings must be piled in a neat, orderly and safe manner and shall not block pedestrian or vehicular traffic. If they remain overnight, safety cones shall be placed at the stump location.

All stumps and roots shall be removed to a depth of at least two (2) feet subgrade.

Proper precaution shall be taken to protect underground utilities when removing stumps. Therefore, the contractor shall coordinate with the appropriate utility before proceeding with work. In addition, the contractor shall take care to protect public and private property such as sidewalks, fences, retaining walls other trees and shrubs and automobiles.

The contractor shall be held strictly responsible for any damage to public or private property and shall make any replacements or repairs at his own expense.

The contractor shall conform to the Tree Care Industry Association (TCIA) for safe tree removal.

The work shall consist of the following: removing whole dead, dangerous and diseased trees and their parts; cutting trees; removing tree trunks, stumps and roots from the ground; backfilling the tree space with topsoil and seeding; disposing of the material properly; and cleaning up the job site area after the work is completed.

All diseased elm wood trees shall be disposed of by burial at a permitted landfill. The successful bidder shall furnish documented proof of such burial.

All tree work shall be conducted in accordance with the American-National Standard Institute (ANSI) Z133 "Safety Requirement, for Tree Pruning, Trimming or Removal."

Prior to award of this contract, the successful bidder shall provide within five (5) days of request, written verification to the contracting officer that all diseased elm wood will be disposed of by proper burial in a legitimate landfill.

For locations where emergency "No Parking" signs are required, the signs shall be provided by the contractor at his expense. A sample of the Emergency "No Parking" sign will be provided by the Urban Forestry

Administration at the contractor's request.

(B) **TREE REMOVAL IN PEPCO WIRES** - Pepco will provide the contractor assistance in removing trees in Pepco wires. For tree removal, Pepco shall provide the clearance required such that a professional tree trimmer who is not qualified (to work near electrically energized facilities) can complete the job. See OSHA Standards (29 CFR Part 1910) with amendments as of February 3, 1997, Section 1910.333.

All brush and debris created from Pepco work shall be left for the contractor to remove and dispose of.

All tree work shall be performed according to the following:

ANSI Standard (A3001995) American National Standard Practices for Trees Shrubs and other Woody Plant Maintenance.

ANSI Standard (Z133.11994) American National Standard for Tree Care Operations, Safety Requirements.

Department of Labor OSHA Standard (29 CFR Part 1910) with Amendments as of February 3, 1997.

(C) **BACKFILLING** - Upon the completion of the stump removal, the remaining hole and any scarred area caused by removal shall be filled with topsoil, tamped, finely raked to remove stones and unsuitable debris, and seeded.

After the hole has been filled, the contractor shall lightly rake seed into the top ½" inch of topsoil. The seed shall be 100% W31 from a currently available crop with a test date not older than nine (9) months prior to sowing. Sowing shall be at the rate of three (3) pounds per 1,000-square feet.

(D) **DISPOSAL** - Removed trees, brush, chips and stump grinding materials (shavings) and all other tree parts shall be disposed of by and at the expense of the contractor.

(E) **RESTORATION OF THE WORK AREA** - After all work is completed at any location, the contractor shall restore the work area and clean up all debris generated by the work at his own expense.

The contractor shall perform the following to restore the work area, remove tree stumps, roots and surface roots; and sweep all surrounding pavement, removing twigs and sawdust.

The contractor shall not leave any tree parts on the job site more than 24 hours from the start of work on any tree.

(F) **MEASURE & PAYMENT** – The requirements of 608.01(C) and (D) apply.

C.5.30. TREE PROTECTION AND REPLACEMENT, Item 608 072

(A) GENERAL. This project specification supplements and modifies Section 608.07.

- Tree protection shall be installed prior to and throughout construction. Fencing shall be removed at the end of the project.
- Install six (6) foot high chain link fencing to protect existing street trees to remain within the limits of disturbance or directly adjacent to.
- For trees within continuous planting strips, protection should extend to the critical root zone which equals one foot of tree protection for every inch in tree diameter (e.g. a tree with a 12-inch DBH, or diameter at breast height, would require 12 ft. of tree protection on every side measured from the base of the tree.)
- For tree boxes, a tree protection frame should be installed and consist of four posts 6 ft. high placed at the four corners of the box with a minimum delineated area of the existing tree box (e.g. 4' x 9', 6' x 10', etc.). The posts shall not extend into the ground.
- If construction cannot be avoided within the critical root zone, the existing tree must be protected with fencing at minimum 2 ft. on all sides from the root flare (crown) and all other unpaved areas must be covered with a protective 10" layer of wood chips.
- None of the following shall occur within the critical root zone: trenching, alteration or disturbance to existing grade; staging/storage of construction materials, equipment, soil, or debris; disposal of any liquids e.g. concrete, gas, oil, paint, and blacktop.
- Trees that are protected must be watered every 10 days from April through September.
- Section 608.07 Tree Protection and Replacement of the DDOT Standard Specifications 2013 shall apply should any damage occur to the existing street trees.

(B) MEASURE & PAYMENT – The requirements of Section 608.07(C) apply.

C.5.31. THERMOPLASTIC PAVEMENT MARKINGS, Items 612 054, 612 058, 612 064, 612 066, 612 068, and 612 070

This project specification includes the following pay items:

- 4 Inch Solid, Item 612 054
- 6 Inch Solid, Item 612 058

- 12 Inch Solid White, Item 612 064
- 24 Inch Solid White, Item 612 066
- Letter, Item 612 068
- Arrow, Item 612 070

This project specification supplements Section 616.12.

Supplementing Section 612.12 (A) **Description** – Work under these items consists of furnishing all materials for and installation of permanent thermoplastic lane for the project as depicted in the contract drawings or as directed by the Engineer. If the roadway is to be immediately opened to traffic, then the pavement marking shall be installed within 24 hours after placement of the final roadway surface.

Supplementing Section 612.12(C) **Construction Requirements** – The newly applied markings shall be protected by traffic cones, or other approved measures until such time as the material has dried sufficiently to bear traffic.

Supplementing Section 612.12 (F) **Measure and Payment** – Thermoplastic pavement markings, **INCH DASH**, will be measured and paid for based on the length of the marking stripe only.

C.5.32. STEEL PROTECTION PLATES, Item 612 104

This project specification replaces Section 612.19(H) with the following:

H. MEASURE AND PAYMENT: Unit of measure for Steel Protection Plates will be each. The total number of plates shown in the Contract Plans will be for the entire project (jobs). Payment will be at the Contract unit price per each, which payment will include furnishing and placing steel plates and asphaltic concrete, spiking, relocating plates to anywhere within the project limits, and removal of the plates.

C.5.33. UNDERCUT EXCAVATION AND BACKFILL, Item 620 085

(A) GENERAL

When material at excavation grade is unsuitable, excavation bottom shall be undercut to depth and width as directed by the Engineer. Undercut volume shall be backfilled with gravel or crushed stone per Section 804.06, compacted with a vibratory compactor, protected, and maintained. Work includes disposal of excavated material.

(B) MEASURE AND PAYMENT

The unit of measure for Undercut Excavation and Backfill will be the cubic yard, with volumes computed from approved undercut dimensions

as measured in the field.

Payment for Undercut Excavation and Backfill shall be made at the Contract unit price per cubic yard (CY) complete in place as measured above, which payment will include labor, materials, tools, equipment, and incidentals necessary to complete the Work as specified herein, including furnishing, hauling, and compaction.

C.5.34. BORROW EXCAVATION BACKFILL, Item 620 086

(A) GENERAL

Excavation soils meeting requirements of Section 804.05 shall be used as fill, and shall be protected and maintained; furnishing approved borrow soils to replace approved trench excavation soils that become unsuitable shall be at the Contractor's expense.

When excavation soils fail to meet requirements of Section 804.05 or when the quantity of approved excavation soils is insufficient, approved borrow excavation backfill per Section 804.05 shall be used and payment made under Borrow Excavation Backfill.

Flowable fill meeting the requirements of Section 804.07 may be used for excavation backfill if approved by the Engineer.

(B) MEASUREMENT AND PAYMENT

The unit of measure for Borrow Excavation Backfill will be the cubic yard (CY). The number of cubic yards will be computed by the average end area method; however, the Engineer may substitute other methods to determine the exact quantity. Measurement for Borrow Excavation Backfill shall be limited to the excavation limits as measured in the field although its use beyond these limits will be required to properly backfill the trench as excavated. The space occupied by the ductbank will not be included in the measurement.

The actual number of cubic yards as determined above will be paid for at the Contract unit price per cubic yard (CY), which payment will include all labor, materials, tools, equipment and incidentals necessary to complete the Work as specified herein including furnishing, hauling and compaction.

C.5.35. THERMAL BACKFILL FOR CROSSING OF EXISTING PEPCO TRANSMISSION LINES, Item 620 091

(A) DESCRIPTION

This specification describes those requirements for installing conduit or duct banks at a crossing or parallel installation with a transmission (69KV and above) feeder or duct bank where a 10ft horizontal and 4ft vertical clearance cannot be maintained.

The intent of this specification is to best mitigate the mutual heating effects between and among Transmission feeders where crossings or parallel installations occur. The mitigation methods incorporate certain design features, including additional thermal backfill above and beyond the nominal PHI trench design, to improve heat transfer means away at the crossings.

For 34kV self-contained feeders maintain a minimum of 2ft vertical and 5ft horizontal clearance for all crossings and parallel installations.

The Contractor will be responsible for any damage done to the existing PHI system due to negligence.

(B) REFERENCE STANDARDS

1. IEEE Standard 422-1981, "IEEE Guide for Soil Thermal Resistivity Measurements"

2. AEIC CG3-2005, "Guide for Installation of Pipe-Type Cable Systems"

3. AEIC CG4-97, "Guide for Installation of Extruded Dielectric Insulated Power Cable Systems Rated 69kV Through 138kV"

(C) SUBMITTALS

The Contractor shall provide certification from the thermal backfill manufacturer verifying the purchased mix meets the required specification. In addition, the Contractor shall dig test pits to determine the exact location and condition of the existing transmission line. Based upon the information obtained from the test pits, the contractor shall verify the following

- Elevation of the trench bottom and limits of any existing thermal backfill
- Elevation of the ground surface
- Elevation of the crown or center-line burial of the transmission lines
- Width and elevation of the existing transmission trench and proposed ductbank crossing
- Approximate angle and orientation of the feeders at the location of the crossing.

(D) THERMAL BACKFILL TESTING

1. If the thermal backfill consists of a granular backfill (thermal sand, etc.), Contractor shall confirm that the source of the material is from an approved supplier. If the special backfill is a fluidized thermal backfill (FTB), Contractor shall confirm that the mix design complies with Pepco's approved mix design.

2. Contractor shall collect two samples of the special backfill material to be used at each crossing location.

3. Backfill material samples shall be collected in Shelby tubes that are sealed to retain the naturally occurring moisture content of the samples. If only disturbed soil samples are available, plastic bags that shall be used to collect a minimum 5lb sample.

4. Backfill material sample must be sent to a PHI-Approved Supplier as noted below:

GeothermUSA
Contact: Mr. Nimesh Patel
4370 Contractors Common
Livermore, CA 94551
Telephone: 925-999-9232
Fax: 925-999-8837
E-mail: nimesh@geothermusa.com

Alternative soil testing laboratories proposed by Consultant and/or Contractor shall be submitted to Pepco's Transmission Engineer for approval.

5. If a granular backfill (thermal sand, etc.) is used, compaction test shall be performed approximately every 200ft or at the discretion of the Pepco inspector. If fluidized thermal backfill is used, concrete an air content, thermal resistivity test and Compressive Strength test shall be performed every 200ft or at the discretion of the Pepco inspector.

(E) CROSSING CONFIGURATION

The following paragraphs refer to locations where crossings or parallel installation of transmission lines cable are unavoidable.

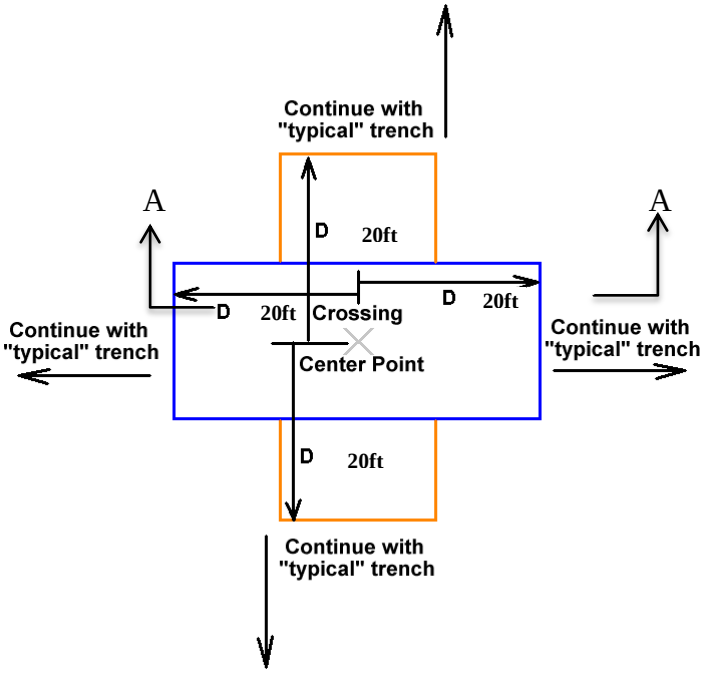
1. As much as practical given site conditions, existing underground obstructions and other site-specific factors, crossing of underground feeders shall be constructed in such a way that the crossing is as close to orthogonal (90° angle) between the feeders as possible. A proposed crossing with less than a 45° angle is not acceptable.

2. The trench depth shall be excavated to a minimum of 12 inches below the bottom of the lowest installed cable pipe, cable conduit or direct-buried cable at the location of the crossing.

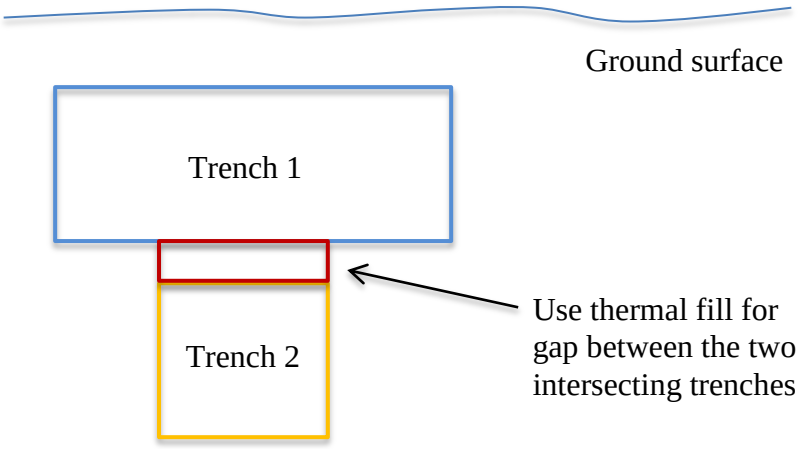
3. The trench must be at least 4 feet wide with an additional 6 inch clearance on each outside edge of the pipe or conduit.

4. The length of trench to be excavated in this manner shall be 20 feet to either side of the center point of the crossing. Contractor will be required to coordinate with Pepco to install thermocouple leads and perform the Holiday test on the existing feeders, as known as “jeeping the line”, before backfilling.(pipe-type only)

Crossings

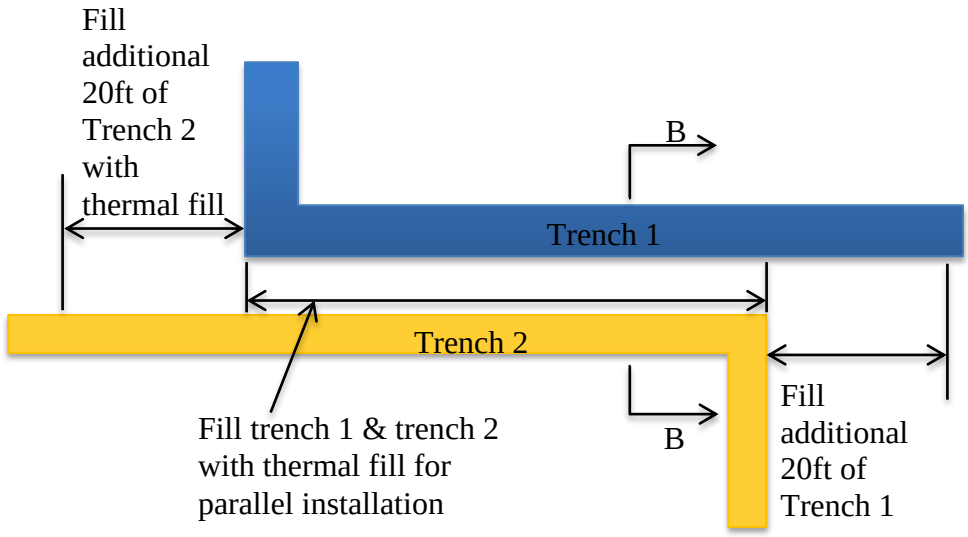


Plan View

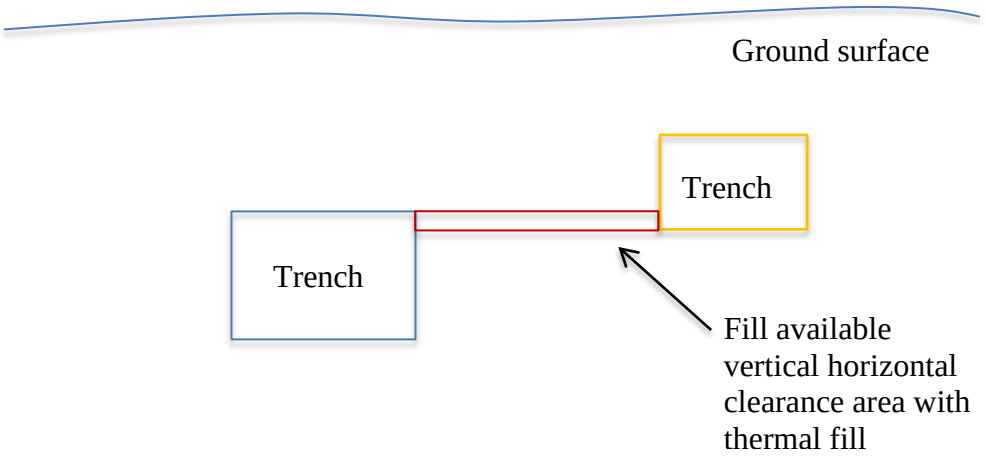


Section A-A

Parallel Installations



Plan View



Section B-B

5. Trench to be filled with a Pepco-approved low thermal resistive thermal backfill. Either thermal sand or fluidized thermal backfill (FTB) are acceptable with approval of Pepco. FTB is used for crossings and parallel runs where the required

clearance cannot be met. Pepco requires a minimum of 10 feet for horizontal clearance and 4 feet for vertical clearance, however, if these clearances cannot be met, FTB can be used to reduce the horizontal clearance to as little as 5 feet (absolute minimum) and the vertical clearance to as little as 2 feet (absolute minimum). Either thermal sand or FTB can be used as backfill for crossings when clearances can be met and maintained. Trench must be filled with Pepco approved thermal sand or fluidized thermal backfill twenty (20) feet in both directions from the crossing or 20ft from the point of diversion for parallel trenches. When using thermal backfill, the cable cover of the thermal backfill shall be at least 12 inches.

If thermal sand is specified by Pepco, the thermal sand shall be installed in 6 inch lifts and thoroughly compacted to 95% proctor density between each layer. The Contractor shall perform compaction tests during the project, and if the material fails to meet the density specified, the compaction method shall be altered as is necessary to achieve the specified density.

If a fluidized thermal backfill is specified by Pepco, the Contractor shall install the FTB in a manner that does not deflect or otherwise damage the cable pipe (or pipe coating), cable conduit or direct buried cables. As FTB is introduced into the trench, the sheathing shall be removed from the sides of the trench to allow the FTB to fill any soil voids. The FTB shall have the following characteristics:

- Air content: The FTB used for the trench shall be non-air-entrained and the trapped or dissolved air content should not exceed 2%. The contractor should confirm this by conducting air content test on the site delivered material.

- Thermal Resistivity: The thermal resistivity of the FTB shall not be higher than 50 C°-cm/watt with 4% moisture content. A set of 2 samples shall be tested by an independent laboratory to confirm this prior to its installation. In addition, samples shall be tested for quality assurance purposes at every crossing location along the route.

- Compressive Strength: The 28-day compressive strength of the ductbank concrete shall comply with PHI standards for the type of installation. Samples shall be tested at regular intervals (or at the discretions of PHI's Field Engineer) for quality assurance in accordance with ASTM, ACI (American Concrete Institute) or equivalent local standards.

(F) EXECUTION

The following paragraphs refer to trenching and backfilling activities as they relate to the crossing of existing transmission lines.

1. Open trench installation shall be buried in the trench configuration as shown in Drawings. The cable pipe, cable conduit or direct buried cable shall be installed in a manner consistent with Pepco's standards and using Fluidized Thermal Backfill or thermal sand for the entire depth of the excavated trench to 12 inches above the pipe or conduit.

2. The trench bottom at final grade shall be smooth, uniform, compacted, and free from foreign matter. Nothing shall be left in the trench that might damage the pipe coating or cable jacket.

3. The Contractor shall maintain the trench free of water until work is complete.

4. Dewatering and water discharge activities shall be in accordance with Pepco and local requirements.

5. If areas of apparent high thermal resistivity are found (e.g. landfill material, highly organic material, clay), the Contractor shall increase the trench dimensions as directed by Pepco and place additional controlled backfill in the trench. Unit bid prices shall be used for compensating for the enhanced trench in these areas beyond those shown on Drawings.

(G) MEASUREMENT AND PAYMENT

The unit of measure for Thermal Backfill for Crossing of Existing Pepco Transmission Lines will be the cubic yard (CY). The number of cubic yards will be computed by the average end area method; however, the Engineer may substitute other methods to determine the exact quantity. Measurement for Thermal Backfill for Crossing of Existing Pepco Transmission Lines shall be limited to the excavation limits outlined in Section 621.05 although its use beyond these limits will be required to properly backfill the trench as excavated. The space occupied by the ductbank will not be included in the measurement.

The actual number of cubic yards as determined above will be paid for at the Contract unit price per cubic yard (CY), which payment will include all labor, materials, tools, equipment and incidentals necessary to complete the Work as specified herein including furnishing, hauling and compaction.

C.5.36. EXCAVATION AND BACKFILL FOR PEPCO FACILITY CONSTRUCTION, Item 620 090

(A) DESCRIPTION - Work consists of excavation, excavation support, dewatering, supporting utilities, and backfilling, as required in open trenches to specified widths and depths for the installation of Pepco supplied PVC and fiberglass conduits, precast manholes, precast tapholes, and precast well casings, as well as, the construction of Pepco cast-in-place manholes. It shall also include disposal of unsuitable and excess materials.

(B) EXCAVATION – Excavation is unclassified and includes the removal of soil materials, obstructions, and abandoned utilities. The Contractor shall excavate to the required elevations regardless of the nature and character of the subsurface conditions encountered.

No soil boring data or geotechnical investigations were conducted as part of this project.

(C) EXCAVATION SUPPORT - The Contractor shall furnish, place, maintain, and remove such sheeting, bracing and other supporting material required to properly support excavation side walls and side walls of cuts. The Contractor shall prevent the movement of any supporting material that might in any way injure persons or negatively impact the project other structures near the project, or reduce excavation dimensions below those needed for proper construction.

Where excavation depths exceed 5 feet, adequate shoring is required. For deep trench cuts, adequate trench shields, braced or un-braced sheeting may be necessary.

Working drawings for the proposed method for excavation support, maintenance, and shoring removal shall be prepared under the direction, and bear the seal, of a Registered District of Columbia Professional Engineer with a valid District of Columbia P.E. license. Working drawing submittals will be for information only and shall be submitted in advance of Work. The Engineer shall be notified in advance of any change in method of excavation support and maintenance.

If the Contractor elects to use sheeting, the sheeting shall be removed in conjunction with backfilling operations; however, if approved in writing, sheeting may be cut off and left in place below a line one foot (1') above the top of the pipe.

Voids that may develop outside the sheeting, shoring, and bracing shall be promptly filled with appropriate material such as gravel, sand, or other approved material. If at any point sufficient or proper supports have not been provided, the Engineer may order additional supports to be installed at no cost to the District.

(D) EXCAVATION FOR PEPCO FACILITY CONSTRUCTION - Excavation for Pepco facility construction shall include removal of all materials and objects of whatever nature encountered in excavation, excluding Rock and existing steel sheeting left in place, unless otherwise directed by the Engineer.

Excavation for Pepco facility construction shall be coordinated with other utility work and maintenance of traffic provisions.

Trench widths and depths for Pepco duckbank construction shall be in accordance with Table (A).

Surface materials of whatever nature shall be removed within excavation limits unless otherwise directed by the Engineer.

Before excavating, cuts through existing hard surface roadways shall be made by saw cutting through the full depth of the hard surface along the excavation limit line. The types of paving materials to be cut are indicated in the Contract Documents but are not guaranteed.

Use of impact type breakers for PCC and AC removal over excavations shall be restricted to the hoe ram type or approved equivalent. This equipment may be restricted or prohibited when in the public interest.

Operations shall be conducted so as to avoid injury to tree trunks, branches, and roots. Excavations within limits of tree root spread shall proceed with care either by use of hand tools or with equipment that will not cause tree root damage. Exposed roots 2-inches and larger in diameter shall be wrapped in burlap or other approved material and kept moist at all times. Roots 2-inches and larger in diameter outside the actual space occupied by the ductbank or manhole shall not be cut; excavation shall be tunneled under these roots. When utilities must be installed in the root zone, tunneling shall be used in lieu of trenching and root pruning. Pneumatic excavation tools or hydro-excavation techniques shall remove soil under and around roots to create openings for pipes, cables, or other utility lines. When approved by the District's Department of Transportation Urban Forestry Administration, tree branches that interfere with construction may be trimmed in advance of excavation. Root cutting and branch trimming shall be performed in accordance with accepted horticultural practice.

When excavating through lawns, parks, or other tillable areas, sod and topsoil shall be removed with care as directed and salvaged if suitable for reuse in restoring disturbed surfaces.

TABLE (A) – TRENCH WIDTHS AND DEPTHS FOR PEPCO DUCTBANK CONSTRUCTION

TYPICAL TRENCH WIDTHS AND DEPTHS FOR 4-INCH PVC DUCTBANKS

DUCT CONFIGURATION	36" COVER	48" COVER	60" COVER	72" COVER	84" COVER	96" COVER	108" COVER	120" COVER
2-WAY (2H-1V)	18"W x 47"D	24"W x 59"D	30"W x71"D	30"W x 83"D	36"W x 95"D	36"W x 107"D	42"W x 119"D	42"W x 131"D
4-WAY (2H-2V)	24"W x 53"D	30"W x 63"D	30"W x 77"D	36"W x 89"D	36"W x 101"D	42"W x 113"D	42"W x 125"D	42"W x 137"D
6-WAY (2H-3V)	24"W x 58"D	30"W x 70"D	30"W x 82"D	36"W x 94"D	36"W x 106"D	42"W x 118"D	42"W x 130"D	42"W x 142"D
8-WAY (2H-4V)	30"W x 64"D	30"W x 76"D	36"W x 82"D	36"W x 100"D	36"W x 112"D	42"W x 124"D	42"W x 136"D	42"W x 148"D

TYPICAL TRENCH WIDTHS AND DEPTHS FOR 5-INCH FIBERGLASS DUCTBANKS

DUCT CONFIGURATION	36" COVER	48" COVER	60" COVER	72" COVER	84" COVER	96" COVER	108" COVER	120" COVER
2-WAY (2H-1V)	24"W x 47"D	24"W x 59"D	30"W x 71"D	30"W x 83"D	36"W x 95"D	36"W x 107"D	42"W x 119"D	48"W x 131"D
4-WAY (2H-2V)	24"W x 55"D	30"W x 65"D	30"W x 79"D	36"W x 91"D	36"W x103 "D	42"W x 115"D	42"W x 127"D	42"W x 139"D
6-WAY (2H-3V)	24"W x 61"D	30"W x 73"D	30"W x 85"D	36"W x 97"D	36"W x 109"D	42"W x 121"D	42"W x 133"D	42"W x 145"D
8-WAY (2H-4V)	30"W x 68"D	30"W x 80"D	30"W x 85"D	36"W x 104"D	42"W x 116"D	42"W x 128"D	42"W x 140"D	48"W x 152"D

TRENCHING NOTES:

1. W (WIDTH) = HORIZONTAL DIMENSION MEASURED ACROSS OUTSIDE EDGES OF TRENCH.
2. D (DEPTH) = VERTICAL DIMENSION MEASURED FROM EXISTING GRADE TO BOTTOM OF TRENCH.
3. COVER IS MEASURED FROM EXISTING GRADE TO TOP OF DUCT AFTER ENCASEMENT WITH CONCRETE.
4. WHEN TWO OR MORE DUCTS EXISTS SIDE BY SIDE IN THE SAME TRENCH, THE TOTAL TRENCH WIDTH SHOULD BE THE SUM OF WIDTHS GIVEN IN THE TABLES ABOVE.
5. WHEN ONE OR MORE DUCTS EXIST ON TOP OF EACH OTHER IN THE SAME TRENCH, THE GREATER (DEPTH) DIMENSION APPLIES TO THE LOWEST DUCT IN THE TRENCH.
6. SEE PROFILE SHEETS FOR INVERTS AT BOTTOM OF DUCT ON PROPOSED DUCTBANKS.
7. SEE SPECIAL PROVISIONS FOR MEASUREMENT AND PAYMENT ON DUCTBANK EXCAVATION.
8. TRENCH DEPTHS OF 60- INCHES OR GREATER (INDICATED BY THE GREY SHADED AREAS ABOVE) MUST BE SHEETED OR SHORN IN ACCORDANCE WITH OSHA EXCAVATION AND TRENCHING STANDARDS CODIFIED IN 29 CFR -1926.650, 29 CFR - 1926.651, AND 29 CFR - 1926.652.

When approaching existing underground construction that may be in proximity to ductbank grades, or approaching existing underground electric ductbanks for connections, the trench shall be opened a sufficient distance ahead of the Work, test pits made per Section 212, or other approved exploratory methods employed to allow for authorized

changes in line and grade. Changes in line and grade plus excavation and ductbank removal caused by failure to take such precautions shall be made at the Contractor's expense.

TABLE (B) – EXCAVATION DIMENSIONS FOR PEPCO MANHOLE CONSTRUCTION

TYPICAL MANHOLE EXCAVATION DIMENSIONS (W x L x D)

MANHOLE SIZE	INTERIOR MANHOLE HEIGHT					
	7' - 0"	8' - 0"	9' - 0"	10' - 0"	11' - 0"	12' - 0"
4' - 6"' x 6' - 0"	7' - 6" x 9' - 0" x 9' - 3"	7' - 6" x 9' - 0" x 10' - 3"	7' - 6" x 9' - 0" x 11' - 3"	7' - 6" x 9' - 0" x 12' - 3"	7' - 6" x 9' - 0" x 13' - 3"	7' - 6" x 9' - 0" x 14' - 3"
6' - 0" x 12' - 0"	9' - 0" x 15' - 0" x 9' - 3"	9' - 0" x 15' - 0" x 10' - 3"	9' - 0" x 15' - 0" x 11' - 3"	9' - 0" x 15' - 0" x 12' - 3"	9' - 0" x 15' - 0" x 13' - 3"	9' - 0" x 15' - 0" x 14' - 3"
6' - 0" x 18' - 0"	N/A	N/A	N/A	9' - 0" x 21' - 0" x 12' - 3"	N/A	N/A
6' - 0" x 14' - 0"	9' - 0" x 17' - 0" x 9' - 3"	9' - 0" x 17' - 0" x 10' - 3"	9' - 0" x 17' - 0" x 11' - 3"	9' - 0" x 17' - 0" x 12' - 3"	9' - 0" x 17' - 0" x 13' - 3"	9' - 0" x 17' - 0" x 14' - 3"

MANHOLE EXCAVATION NOTES:

1. MANHOLE SIZES SHOWN ABOVE ARE INTERIOR DIMENSIONS (PEPCO STANDARDS).
2. W (WIDTH) = HORIZONTAL DIMENSION MEASURED ACROSS OUTSIDE EDGES OF EXCAVATION (PARALLEL TO MANHOLE SHORT WALLS).
3. L (LENGTH) = HORIZONTAL DIMENSION MEASURED ACROSS OUTSIDE EDGES OF EXCAVATION (PARALLEL TO MANHOLE LONG WALLS).
4. D (DEPTH) = VERTICAL DIMENSION MEASURED FROM EXISTING GRADE TO BOTTOM OF EXCAVATION.
5. MINIMUM DIMENSION FROM EXISTING GRADE TO RIM OF MANHOLE UNITS (WITHOUT TOP) IS 21".
6. A DISTANCE OF 1' - 0" AROUND THE OUTSIDE PERIMETER OF THE MANHOLE UNITS HAS BEEN ADDED TO THE FIGURES ABOVE TO ACCOUNT FOR SHEETING AND SHORING REQUIREMENTS.
7. SEE PROFILE SHEETS FOR MANHOLE INVERT AND TOP ELEVATIONS.
8. SEE SPECIAL PROVISIONS FOR MEASUREMENT AND PAYMENT ON MANHOLE EXCAVATION.
9. EXCAVATION DEPTHS OF 5' - 0" OR GREATER (INDICATED BY THE GREY SHADED AREAS ABOVE) MUST BE SHEETED OR SHORN IN ACCORDANCE WITH OSHA EXCAVATION AND TRENCHING STANDARDS CODIFIED IN 29 CFR-1926.650, 29 CFR-1926.651, AND 29 CFR-1926.652.
10. AN ADDITIONAL 0' - 6" IN EXCAVATION DEPTH IS INCLUDED IN THE TABLE ABOVE FOR CRUSHED STONE BEDDING.

The Contractor shall support all exposed underground pipes or conduits along their entire exposed length using timber or steel in such a manner that backfilling may be performed without dislodging such pipes or conduits. No additional payment will be made for support material left in place or for installing and maintaining supports.

At the Contractor's option, the actual width of trench above the top of the ductbank may exceed the permissible width below the top of the ductbank, if approved by the Engineer. No additional payment will be allowed for the additional excavation and backfill.

Utility service connections and appurtenances to individual premises may not be shown in the Contract Documents, and the Contractor shall determine the exact locations, and maintain, these services.

If material found at the bottom of the excavation is unsuitable for a foundation for Pepco Facility Construction, it shall be removed by the Contractor as directed and replaced with gravel or crushed stone per Project Specification C.5.33 and Project Specification C.5.34.

Except in downtown and other congested areas, excavation shall be completed at least 25 feet in advance of duct bank installation. At the end of a work day or at the discontinuance of Work, the duct bank installation shall be completed to within 5 feet of the end of the open trench.

All excavation material meeting requirements of 804.05, as determined by the DDOT QA/QC Division based upon signed and sealed test results by a D.C. licensed Professional Engineer for samples submitted to a third party laboratory by the contractor as required in 804.01, shall be stockpiled, protected, and maintained offsite. Excavated materials shall be neither temporarily deposited nor stockpiled so as to endanger new or existing structures or utilities, nor to interfere with the Project construction sequence and work by others.

The Contractor shall remove and dispose of all excess and unsuitable materials and shall provide its own disposal area.

(E) ABANDONED UTILITIES

Work includes removal of abandoned utilities, or utilities to be abandoned, within limits of excavation. Open ends of abandoned utilities or utilities to be abandoned, shall be bulk-headed by either 9-inch thick brick masonry in large size openings, 9-inch thick brick masonry or PCC of approved mix design in small size openings, or 9-inch thick PCC of approved mix design or cast iron plugs or caps in small diameter abandoned water mains.

All abandoned in-place sewers with a 36-inch or larger diameter shall be filled with suitable material prior to bulk-heading.

Water mains and water appurtenances shall be abandoned in place as directed. Frames and covers of manholes and valve casings to be abandoned shall be salvaged and returned to the DC Water property yard. Abandoned manholes and water valve casings shall be backfilled to grade with approved trench fill. Abandoned fire hydrants including standpipe and boot shall be removed and delivered to the DC Water property yard; hydrant lateral shall be plugged. Water mains to be salvaged shall be severed as directed with a smooth cut at a joint or at an intermediate point if approved.

Where water valve casings or manholes to be abandoned are isolated from trench excavation limits, they shall be abandoned in place as indicated above and payment made per Sections 303 or 313 as applicable.

Breakage will not be permitted. 24-inch and larger diameter mains must be cut normally. Any loss of value resulting from damage to usable and surplus water main materials resulting from Contractor operations will be charged to the Contractor.

(F) DEWATERING

Trench dewatering and drainage of all surface and groundwater, including pumping and well points when needed, shall be included as part of excavation and backfill for Pepco Facility Construction.

(G) TEMPORARY PLATING OVER TRENCHES

To maintain traffic and safety, steel protection plates per Section 612.19 shall be used to temporarily Bridge excavations as directed by the Engineer. Plates shall be of a size and positioned to provide adequate bearing at plate edges and shall be securely anchored. Plates shall be of sufficient thickness to safely carry heavy traffic without detrimental deflection. Plate edges exposed to traffic shall be feathered with temporary asphalt mix.

Work includes surveillance and adjustment of plating over excavations that shall be provided by the Contractor during non-work hours, weekends and holidays.

Plating and asphalt around plates shall be removed when directed.

(H) EXCAVATION BACKFILL

When ductbanks and structures are completed and approved, excavations shall be backfilled per Section 203. DDOT approved excavated materials meeting requirements of Section 804.05 and density and moisture per Section 203.03 (A) and (B) shall be used as directed for excavation backfill. Approved base materials shall be used in that portion of the excavation projecting through soils base layers.

Each lift shall be compacted to density requirements herein before the next lift is placed. The compaction of each lift within the top 4 feet of the trench backfill shall be tested by the DDOT Field Inspector.

The minimum in place density of excavation backfill shall be 93 percent for each layer up to 6 inches below subgrade and 95 percent for the top 6-inch layer of Subgrade. In excavations outside of the roadbed areas, all layers shall be compacted to at least 93 percent of standard density. The use of "Hydra-Hammer" for compacting backfill in trenches is prohibited. Compaction by hand will be required where necessary.

Excavation fill soils shall have a uniform moisture content suitable for compacting to specified density. If rutting, pumping, heaving, or shearing occurs under action of compaction equipment even though soil meets density requirements, affected material shall be replaced to limits as directed.

Excavation fill material shall be dumped outside the trench excavation and not end-dumped directly into trench. Fill shall be placed in uniform horizontal layers of not more than 6 inches loose depth and for full trench width. Any fill placed on frozen trench soils shall be removed at the Contractor's expense.

Backfilling shall proceed without displacement of the grade and alignment of the ductbank. Settlement of backfill shall be considered evidence of improper workmanship or inclusion of unsuitable backfill materials, or both, and will require re-grading and realigning the ductbank and removing and re-compacting settled material at no cost to the District.

Puddling and jetting will not be permitted. All excavation shoring and supports shall be so removed that excavation cave-in and settlement are minimized and no voids remain. Voids caused or left by sheeting and shoring removal shall be backfilled with pervious fill or other approved material and compacted at the Contractor's expense. All material displaced by slides, settlement and excavation cave-in shall be removed and replaced with specified soils at the Contractor's expense.

The Engineer may require excavation backfilling over completed ductbank at any time if, in his judgment, such action is necessary. Extra compensation will not be allowed for such excavation backfilling.

The Engineer reserves the right to limit the amount of ductbank laid in advance of backfilling, but in no case shall this amount exceed 100 feet.

(I) MEASUREMENT AND PAYMENT

The unit of measure for Excavation and Backfill for Pepco Facility Construction will be the cubic yard (CY) as measured in the field. Space occupied by abandoned utilities will not be deducted.

Payment for Excavation and Backfill for Pepco Facility Construction shall be made at the Contract unit price per cubic yard (CY) complete in place as measured above, which payment will include all labor, materials, tools, equipment, and incidentals necessary to complete the Work.

C.5.37. PEPCO FACILITY CONSTRUCTION, Items 620 062, 620 063, 620 064, 620 066, 620 067, 620 068, 620 069, 620 070, 620 071, 620 072, 620 074, 620 075, 620 076, 620 077, 620 078, 620 081, 620 082, 620 084, 620 092 and 620 094

This project specification includes the following pay items:

- Install a Precast Sidewalk UG Switch Manhole (6' X 18' All Depths), Item 620 062
- Install a Precast Roadway Manhole (6' X 12' All Depths), Item 620 063
- Install a Precast Roadway Manhole (4.5' X 6' All Depths), Item 620 064
- Construct a Cast-In-Place Sidewalk UG Switch Manhole (6' X 18' All Depths), Item 620 066
- Construct a Cast-In-Place Roadway Manhole (6' X 12' All Depths), Item 620 067
- Construct a Cast-In-Place Roadway Manhole (4.5' X 6' All Depths), Item 620 068
- Install 2 Way Conduit – 4-Inch PVC (All Depths), Item 620 069
- Install 4 Way Conduit – 4-Inch PVC (All Depths), Item 620 070
- Install 6 Way Conduit – 4-Inch PVC (All Depths), Item 620 071
- Install 8 Way Conduit – 4-Inch PVC (All Depths), Item 620 072
- Install 2 Way Conduit – 5-Inch Fiberglass (All Depths), Item 620 074
- Install 8 Way Conduit – 5-Inch Fiberglass (All Depths), Item 620 075
- Install 4 Way Conduit – 5-Inch Fiberglass (All Depths), Item 620 076
- Install 6 Way Conduit – 5-Inch Fiberglass (All Depths), Item 620 077
- Install 2-Way Concrete Encased Fiberglass Ductbank W/Dual Pole Bends, Item 620 078
- Install a Precast Taphole (3.5' L X 3.5' W X 4.0' H), Item 620 081
- Install a Precast Concrete Well Casing (3.5' I.D. X 6.5' H), Item 620 082
- Install 2-Way Concrete Encased PVC Ductbank W/Dual Pole Bends, Item 620 084

- Pepco Furnished Electric Splice Box Installation, Item 620 092
- Install a Fiberglass Pad Mounted Transformer Base (4'-3" X 4'-8"), Item 620 094

(A) DESCRIPTION

Pepco Facility Construction shall consist of furnishing all labor, equipment, and incidentals to install Pepco supplied materials such as PVC and fiberglass conduits, precast manholes, precast manhole tops, precast tap holes, precast transformer wells, manhole frames and covers, and other items as shown in the Contract Documents and as specified herein. Where cast-in-place manholes are required, the Contractor shall furnish and install all concrete and reinforcing steel required for that particular item. This work shall include the installation of Pepco furnished material items as well as the furnishing and placement of concrete to encase the electrical conduits.

1. CODES AND STANDARDS

The material, equipment and installation shall conform to the following:

- American Society for Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- Institute of Electrical and Electronic Engineers (IEEE)
- Insulated Power Cable Engineers Association (IPCEA)
- National Electrical Code (NEC) – Latest Edition
- National Electrical Manufacturers Association (NEMA)
- Underwriters Laboratories, Inc. (UL)
- District of Columbia Electrical Code – Latest Edition
- United States of America Standards Institute (USASI)
- Rules and Regulations of the Potomac Electric Power Company (Pepco)
- International Code Council (ICC)

No work shall be covered at any time prior to inspection.

The Contractor must have a complete set of Contract Drawings, approved shop drawings, catalog cuts, and specifications available at the jobsite for inspection by the Engineer, DDOT, and Pepco.

2. RELATED SECTIONS

Related DDOT specification sections that apply to Pepco Facility Construction work include but are not limited to the following:

- 202.03: Hard Surface Pavement Excavation
- 215: Excavations and Restorations (Utility Lines)
- Project Specification C.5.36
- Division 800 – Materials
- 817.03: Class B, 4,500 PSI Concrete (for cast-in-place manholes)
- 817.03: Class G, 2,500 PSI Concrete (for duct bank encasement)

(B) MATERIALS

1. GENERAL – Material to be furnished by the contractor shall be new, first quality materials, in conformance with Division 800.

2. COORDINATION WITH OTHER TRADES – It shall be the responsibility of the Contractor to coordinate the location of all Pepco Facility Construction items installed under this section with work installed under other sections to the extent that interference among such items is avoided. Any relocation of items as a result of the failure of the Contractor to coordinate his work with the work of other trades shall be at the expense of the Contractor, and incur no additional cost to the DDOT or Pepco.

3. STANDARD PRODUCTS – Unless otherwise indicated, materials furnished by Pepco shall be standard products meeting the requirements of their standards and specifications.

Nomenclature for Pepco manhole, taphole, and transformer well sizes reference interior dimensions for length, width, and height.

Materials to be supplied by Pepco shall be picked up by the contractor from Pepco's Benning Road Stores, located at 3400 Benning Road, NE, Washington, DC. Procedures for reserving, pickup, and return of excess materials will be provided by Pepco upon award of the contract.

Materials to be supplied by the Contractor shall meet the requirements of these specifications. Only specified materials shall be furnished unless changed by mutual agreement between the Contractor, DDOT, and Pepco.

Acceptance of any proposed substitutions shall be subject to the approval of the Engineer, DDOT, and Pepco. If requested by DDOT or Pepco, the Contractor shall submit for inspection samples of both the specified and the proposed substitute items.

In all cases where substitutions are permitted, the Contractor shall bear any cost of evaluating the quality of the alternative materials to be installed.

4. SAMPLES – When samples are required, they shall be submitted to the Engineer and Pepco for approval prior to the pre-construction meeting, but no later than eight (8) weeks after the Award of the Contract. A sample shall comprise of the entire item or representative section or portion thereof (as determined by DDOT or Pepco), and shall be properly marked for identification, and be free of expense to DDOT or Pepco. DDOT or Pepco reserves the right to mutilate or destroy any sample submitted when considered necessary for testing purposes. Samples not mutilated or destroyed will be returned to the Contractor at the Contractor's expense when no longer needed by DDOT. Sections 106.01, 106.02 and 106.03 shall apply to samples and materials used in conjunction with Pepco Facility Construction.

The Contractor shall submit the following:

a) The name of the manufacturer of the material he proposes to furnish.

b) Such data and descriptive materials as may be necessary for the proper procedures and operational characteristics associated with maintenance.

c) Any additional samples if deemed necessary.

5. MATERIALS AND WORKMANSHIP – Installation of work shall be in accordance with the Contract Documents. Defective materials and/or materials damaged in the course of installation or testing shall be replaced or repaired by the Contractor in a manner meeting the approval of DDOT and Pepco without additional compensation.

The Contract Drawings indicate the extent and general arrangement of the Pepco Facility Construction items. If departures from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons

therefore, shall be submitted within two (2) business days to the Engineer, DDOT and Pepco for approval. No departures shall be made without prior written approval.

The Contractor shall be responsible for saw cutting and removing paved areas for accomplishing the Work in accordance with DDOT Standard Specification Section 202.03, “Hard Surface Pavement Excavation”.

The Contractor shall be responsible for all patching necessary for accomplishing the Work in accordance with DDOT Standard Specification Section 215, “Excavations and Restorations (Utility Lines)”. All such modified areas shall be left in as good a repair as prior to the beginning of this Work.

Contractor supplied materials for use in Pepco facility construction shall comply with Division 800.

All excavation and backfill for Pepco Facility Construction shall be in accordance with Project Specification C.5.36.

6. GUARANTY – The Contractor shall guarantee all Pepco Facility Construction work to be in accordance with the Contract requirements and free from defective or inferior materials, equipment and workmanship for a period of two (2) years from Substantial Completion per Section 103.01 ARTICLE 12.

If, within the guaranty period, DDOT and/or Pepco finds that the guaranteed work needs to be repaired or changed because of the use of contractor supplied materials or workmanship which are inferior, defective or not in accordance with the terms of the Contract, the Engineer, DDOT or Pepco shall inform the Contractor in writing and the Contractor shall promptly and without additional expense to DDOT; (1) Place in a satisfactory condition, all such guaranteed work; (2) Make good all damage to materials, the project site, structures and/or related appurtenances, which is the result of such unsatisfactory guaranteed work; and (3) Make good any work, materials and facilities that are disturbed fulfilling the guarantee.

Should the Contractor fail to proceed promptly in accordance with the guarantee, DDOT or Pepco may cause such work to be done by others and the Contractor and Surety or sureties under the bond shall be jointly and severally liable for the cost of same.

(C) CONTRACT PLANS AND DRAWINGS

1. PEPCO FACILITY CONSTRUCTION PLANS – The Contract Documents indicate the general arrangements of all items related to the Pepco Facility Construction work. The Contract Documents are intended to show and describe the work entirely.

However, every item necessary to complete the work may not be specifically shown or described. Contractor supplied incidentals not shown or specified, but necessary for the proper operation of the Pepco facilities shall be included in the work. The Contractor shall be responsible for furnishing all incidental materials for the installation, complete, so as to insure the successful operation of the Pepco facilities.

2. **MANUFACTURER'S DRAWINGS –** Manufacturer's drawings shall consist of all shop and installation drawings, catalogs, performance data, etc. The Contractor shall secure and/or prepare these drawings and submit them as required by Section 105.02 before purchasing materials or proceeding with construction. The Contractor shall check each drawing to insure conformance with the Contract plans and Specifications. Each drawing shall bear the Contractor's signature and certification. Drawings and data not clearly identified will be returned without approval to the Contractor.

   Transmittals accompanying all Shop Drawings shall contain names and addresses of the Contractor, Subcontractors and suppliers. Project title, reference to prior actions on submissions and specification references shall also be indicated.

3. **AS-BUILT DRAWINGS –** The contractor will not be responsible for as-built drawings. DDOT's construction manager will develop as-built drawings.

(D) PEPCO FURNISHED PRECAST MANHOLE INSTALLATION

1. **DESCRIPTION –** The work shall consist of installing Pepco furnished precast concrete manholes, precast tops, hardware, and other related items as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental materials, and equipment necessary for the installation of Pepco furnished precast manhole complete with associated parts and components.

   Pepco furnished materials to be installed by the Contractor shall include pre-cast manhole bases, risers and top slabs (roof), manhole frames and covers, copper wire, ground rods, ground rod clamps, split bolt service connections, bar back chairs, sump pits and covers, common nails, washed building sand and other incidental items.

   The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished precast manholes and other required items from the Benning Stores facility to the project site.

   The Contractor shall verify the exact location of the manholes in the field prior to starting any demolition or excavation work. The

manhole shall be set to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

Before installing the manhole, a 6-inch layer of crushed stone or washed gravel shall be placed, leveled, compacted and then covered with tar paper. After installation, the tar paper shall be removed from the sump or drain hole as directed by Pepco and DDOT.

The Contractor shall install a ground rod (5/8" diameter, 8' long, copper weld) at the corner of the sump pit in each manhole. This ground rod is to be connected to the manhole steel rebars in accordance with Pepco standards.

2. MEASUREMENT AND PAYMENT

INSTALL A PRECAST SIDEWALK UG SWITCH MANHOLE (6' X 18' All Depths), Item 620 062 – The unit of measure for the Installation of a Pepco Furnished Precast Sidewalk UG Oil Switch Manhole (6' x 18') and associated covers/tops, ground rod and clamp parts, and other items will be per each (EA). Payment will be made at the contract unit price for the Installation of a Pepco Furnished Sidewalk UG Oil Switch Manhole (6' x 18'). Payment will include all labor, tools, Contractor furnished materials, equipment, manhole complete with all supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL A PRECAST ROADWAY MANHOLE (6' X 12' All Depths), Item 620 063 – The unit of measure for the Installation of a Pepco Furnished Precast Roadway Manhole (6' x 12') and associated covers/tops, ground rod and clamp parts, and other items will be per each (EA). Payment will be made at the contract unit price for the Installation of a Pepco Furnished Roadway Manhole (6' x 12'). Payment will include all labor, tools, Contractor furnished materials, equipment, manhole complete with all supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL A PRECAST ROADWAY MANHOLE (4.5' X 6' All Depths), Item 620 064 – The unit of measure for the Installation of a Pepco Furnished Precast Roadway Manhole (4.5' x 6') and associated covers/tops, ground rod and clamp parts, and other items will be per each (EA). Payment will be made at the contract unit price For the Installation of a Pepco Furnished Sidewalk Manhole (4.5' x 6'). Payment will include all labor, tools, Contractor furnished materials, equipment, manhole complete with all supplied parts and components installed and all incidentals necessary to complete the Work.

(E) PEPCO CAST-IN-PLACE MANHOLE CONSTRUCTION

1. DESCRIPTION – The work shall consist of constructing Pepco cast-in-place concrete manholes complete with a reinforced concrete manhole floor and walls, piers, joints, armored seats for top slabs, sumps, steps, water stops, anchor bolts, stack risers, lifting inserts, and manhole frames and covers, precast tops, hardware, and other related items all as shown on the Contract Drawings. The Contractor shall furnish all labor, tools and equipment necessary for the furnishing and placement of concrete, 4,500 psi, Class B, and the furnishing and placement of reinforcing steel (reinforcement steel shop drawings shall be submitted by the Contractor) and form work for the construction of a Pepco cast-in-place manhole complete with all associated parts and components installed and all incidentals necessary to complete the Work specified herein.

Pepco furnished materials to be installed by the Contractor shall include pre-cast manhole slabs (roof), manhole frames and covers, copper wire, ground rods, ground rod clamps, split bolt service connections, bar back chairs, sump pits and covers, common nails, washed building sand and other incidental items.

Contractor furnished wet mix concrete (PCC) for cast-in-place manhole construction shall meet the requirements of Section 817.03 for Class B, 4,500 PSI Concrete.

Contractor furnished reinforcing steel for cast-in-place manhole construction shall meet the requirements of 812.02 for reinforcing steel, Grade 60.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished precast manhole tops and other required items from the Benning Stores facility to the project site.

The dimensions of the cast-in-place manhole shall be adjusted as directed by the Engineer to avoid or mitigate impacts to other existing utilities and/or obstructions.

Cast-in-place manholes may be used where adjacent utility or other constraints preclude the use of a precast unit or where Pepco requires the manhole to be constructed around and over an existing energized ductbank.

The Contractor shall verify the exact location of the manholes in the field prior to starting any demolition or excavation work. The manhole shall be constructed to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

If unforeseen obstructions interfere with the designated location, the Engineer, DDOT, and Pepco shall be notified. Whenever possible, the conduit line should be laid before the manhole walls are constructed. If this is not possible and it is known at what level the conduit lines will enter the manhole, the duct entrance should be provided for in the pouring operations by placing a box slightly larger than the ducts against the form. If the duct levels are not known, the walls may be made solid and later cut to provide the duct entrance. In this latter case, the entrance should be cut as soon as possible after removing the forms. The cut should be made with a cold chisel, or a pneumatic air gun, before the concrete has reached its ultimate strength.

Conduit or duct recess entrances will be used where specified on the Contract Drawings and will be constructed substantially as shown on Pepco Drawing No. 2-2-0733. Where ducts enter a line manhole at an angle, a recess should be installed.

Reinforcing schedules shown on manhole and precast roof drawings show the size of the rod in accordance with the numerical bar designation standard from the concrete reinforcing steel schedule institute. The bar numbers are based on the on the number of 1/8 inches included in the nominal diameters.

All reinforcing shall be of the size and length called for on Pepco's standard manhole drawings. Reinforcing shall be clean and free of grease, scale, dirt and loose rust. All floor reinforcing and wall reinforcing must be placed before the floor is poured. Reinforcing steel is to be placed as shown on the manhole specification drawing and is to be wired and held firmly in position by standard chairs and ties while concrete is being placed. The standard manhole drawings indicate the amount, size and spacing of reinforcement and the thickness for floors, walls and roof if not precast. No variations may be made without approval by engineering.

Splices shall be tied, rather than welded. Grade 60 reinforcing steel (ASTM 615) shall not be welded under any circumstances. Where necessary to lap and tie reinforcing steel, the bars shall be lapped in accordance with Pepco Table 2, Specification Section 06.10.4.

The Contractor shall install a ground rod (5/8" diameter, 8' long, copper weld) at the corner of the sump pit in each manhole. This ground rod is to be connected to the manhole steel rebars in accordance with Pepco standards.

Manhole floors shall be of 4,500 psi, Class B air entrained concrete with minimum thickness as specified on the standard Pepco drawings. In rock excavation, the floor should be made

thick enough to fill all depressions. In all cases the floor concrete shall be poured against the inside of the sheeting as shown on Pepco Drawing No. 2-2-0461. All manhole floors should be practically level. Pepco Drawing Nos. 2-2-1060 and 2-2-1096 in Section 6 of the Pepco Standard Specifications describes the sump pump pit.

All forms shall be thoroughly oiled before using. Use standard steel forms whenever they can be used and are available. Pepco Drawing No. 2-2-0499, in Section 7, “schedule of steel manhole forms” shows the required number of sections of steel forms and accessories required for standard manholes. Be sure that the forms are center so that all walls will be of uniform thickness. As successive tiers of forms are placed, be sure that they are plumb and level.

In pouring manhole walls it is desirable that the concrete be of such consistency that it will flow readily down the chute and settle closely around the reinforcing steel, but in no case shall the slump exceed 5-1/2 inches nor the water/cement ratio exceed 7 gallons per 94 pound sack of cement (0.62 Lbs. Water per Lbs. Cement). When pouring concrete in manhole forms, whether for a manhole with a precast roof or for a manhole with roof to be formed and poured in place, walls and roof slabs shall not be poured as a continuous operation. The walls shall be poured in one or two or more operations, if required, to the underside of the roof slab or to a point not more than (6) six inches below the roof frame. The concrete for the manhole walls shall be 4,500 psi, Class B with air entrainment. The concrete shall be vibrated thoroughly with vibrators to remove air pockets and to work the larger aggregate away from the form for a smooth compact wall.

All Pepco equipment manholes shall have removable roofs to facilitate equipment installation and replacement. All mainline Pepco manholes in roadway and sidewalk areas shall utilize precast roofs to help minimize obstruction to traffic during construction.

Forms should not be removed from the manhole until the concrete has taken a firm set. In dry warm weather forms may be removed sooner than in cold weather. Increase the time forms are kept in place with the decrease in temperature. Under the best conditions, traffic should not be permitted to pass over a manhole for a period of at least 72 hours (3 days) when 4,500 psi, Class B concrete is used. Do not remove forms until the concrete has attained approximately 80 percent of its design strength. Refer to ACI- 318-77 code section 6.2. Table 3 shall be used only as a guide for the time of removal for forms.

Manhole roofs shall be precast slabs provided by Pepco. Use the frames and covers, slabs and gratings called for in the Contract Drawings for the particular manhole under construction.

2. SUBMITTALS – Shop drawings shall be submitted per Section105.02 for reinforcing steel layout, cast iron frames and covers, vault steps and anchor bolts for Pepco Cast-in-Place manholes.

3. MATERIALS

812.02: Reinforcing Steel, Grade 60

817: Cast-in-Place Wet Mix Concrete (PCC), Class B

4. MEASUREMENT AND PAYMENT

CONSTRUCT A CAST-IN-PLACE SIDEWALK UG SWITCH MANHOLE (6' X 18' All Depths), Item 620 066 – The unit of measure for the construction of a Pepco Cast-in-Place Sidewalk UG Oil Switch Manhole (6' x 18') and installation of associated covers/tops, ground rod and clamp parts, and other items will be per each (EA). Payment will be made at the contract unit price to install a Pepco Cast-in-Place Sidewalk UG Oil Switch Manhole (6' x 18'). Payment will include all labor, tools, Contractor furnished concrete and reinforcing steel, materials, manhole complete with all supplied parts and components installed and all incidentals necessary to complete the Work.

CONSTRUCT A CAST-IN-PLACE ROADWAY MANHOLE (6' X 12' All Depths), Item 620 067 – The unit of measure for the construction of a Pepco Cast-in-Place Roadway Manhole (6' x 12') and installation of associated covers/tops, ground rod and clamp parts, and other items will be per each (EA). Payment will be made at the contract unit price to install a Pepco Cast-in-Place Sidewalk Manhole (6' x 12'). Payment will include all labor, tools, Contractor furnished concrete and reinforcing steel, materials, equipment, manhole complete with all supplied parts and components installed and all incidentals necessary to complete the Work.

CONSTRUCT A CAST-IN-PLACE ROADWAY MANHOLE (4.5' X 6' All Depths), Item 620 068 – The unit of measure for the construction of a Pepco Cast-in-Place Roadway Manhole (4.5' x 6') and installation of associated covers/tops, ground rod and clamp parts, and other items will be per each (EA). Payment will be made at the contract unit price to install a Pepco Cast-in-Place Sidewalk Manhole (4.5' x 6'). Payment will include all labor, tools, Contractor furnished concrete and reinforcing steel, materials, equipment, manhole complete with all supplied parts installed and all incidentals necessary to complete the Work.

(F) PEPCO FURNISHED CONDUIT INSTALLATION

1. DESCRIPTION – The work shall consist of installing Pepco furnished PVC or fiberglass conduit, base spacers, intermediate spacers, couplings, tying straps, and other related items as shown on the Contract Plans. The Contractor shall furnish all labor, tools, concrete, and form work for duct bank encasement, incidentals, and equipment necessary for the installation of Pepco furnished PVC or fiberglass conduit and associated parts and components.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished conduit, spacers, couplings and other parts from the Benning Stores facility to the project site.

Conduit sizes and configurations are shown on the Contract Drawings.

Fiberglass Reinforced Epoxy Conduit and fittings to be furnished by Pepco shall be 5-inch IPS (0.095-inch wall thickness). Conduit shall be supplied in 10 foot lengths (9.84') with integral bell end or one FRE or PVC coupling attached with an adhesive. Conduit supplied in 20 foot lengths shall have one integral belled end only. Conduit shall be UV stabilized to enhance outdoor storage. The manufacturer should certify that the conduit meets or exceeds NEMA TC14-A specification.

Polyvinyl chloride (PVC) conduit and fittings to be furnished by Pepco shall be 4-inch IPS, schedule 40, supplied in 10 foot lengths with one integral belled end or one PVC coupling attached with an adhesive. The socket depth of the belled end shall be 3.5" + 0.5". The conduit shall be manufactured and tested per NEMA TC-2, latest revision. Conduit shall be UV stabilized to enhance outdoor storage. PVC conduit shall be used for end bell manhole connections.

The Contractor shall verify the exact location of the duct bank in the field prior to starting any demolition or excavation work.

Ductbank profiles have been provided in the Contract Plans for all spans that run from manhole to manhole. These profiles show proposed grades and depth of cover.

When an obstruction is encountered in the trench and it becomes necessary to dig a considerably deeper trench than would otherwise be required, consult Pepco and DDOT to determine whether the extra excavation should be made in order to obtain suitable clearance for the conduit.

Keep the trench free from water by pumping or draining. If a wet condition is encountered which cannot be drained permanently,

it may be advisable to encase the conduit in concrete with steel mesh to prevent cracking. Do not use this type of construction without obtaining written approval of Pepco and DDOT.

Contractor furnished wet mix concrete (PCC) for duct bank encasement shall meet the requirements of Section 817.03 for Class G, 2,500 psi concrete.

After sufficient time has elapsed to allow the comparative hardening of the concrete encasement for fiberglass or PVC duct, the trench must be backfilled with soft materials free from hard substances to a point level with the top of the duct, and this portion of the trench must be compacted with hand rammers (a pick handle or other suitable device will suffice). Care must be exercised not to disturb the alignment of the duct structure. Backfill may then proceed and pneumatic tampers used after one foot (1') of backfill material similar to that mentioned above is in place above the top of the conduit. Backfill and tamping shall be done in six inch (6") layers.

Contractor shall ensure that all ducts have clean bores before they are laid. When necessary, clean and scrape them.

After the conduit has been encased, but prior to permanent resurfacing, a mandrel (one-half inch less than the inside diameter of the conduit and 8-inches long for straight section and sweep bends) shall be pulled through each duct trailed by a polyolefin (1,000) pound test pull-in-cord.

Conduits through which the proper mandrel cannot be drawn are defective and should be replaced or repaired immediately. After repairs are made, redraw the mandrel through the repaired conduit.

A polyolefin pull-in-cord (1,000 pound test) shall be left in each individual duct.

Ducts shall be plugged tightly with plastic plugs or approved equivalent at the close of each day's work, or whenever work is to be discontinued for any length of time, so as to prevent the entrance of water and dirt into the ducts.

The Contractor shall not build conduit structures that would encase foreign pipes without special instructions and approval from Pepco and DDOT. Where it is necessary to include foreign pipes crossing the trench in the conduit structure, surround the foreign pipes with split duct or build a wood box, so as to permit the pipes to be withdrawn if necessary without disturbing the conduit structure.

When necessary, the Contractor may have to change duct formation between manholes in order to clear obstructions in the trench or to pass through a restricted space. This change should be made only upon written approval of Pepco and DDOT. Whenever possible, the duct should enter the manholes at each end of the same section with the same formation and with the ducts in the same relative position.

2. MEASUREMENT AND PAYMENT

INSTALL 2 WAY CONDUIT – 4-INCH PVC (All Depths), Item 620 069 – The unit of measure for the Installation of Pepco Furnished 2 Way Conduit – 4-Inch PVC including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 2 Way Conduit – 4-Inch PVC. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 4 WAY CONDUIT – 4-INCH PVC (All Depths), Item 620 070 – The unit of measure for the Installation of Pepco Furnished 4 Way Conduit – 4-Inch PVC including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 4 Way Conduit – 4-Inch PVC. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 6 WAY CONDUIT – 4-INCH PVC (All Depths), Item 620 071 – The unit of measure for the Installation of Pepco Furnished 6 Way Conduit – 4-Inch PVC including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 6 Way Conduit – 4-Inch PVC. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 8 WAY CONDUIT – 4-INCH PVC (All Depths), Item 620 072 – The unit of measure for the Installation of Pepco Furnished 8 Way Conduit – 4-Inch PVC including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit

price for the Installation of Pepco Furnished 8 Way Conduit – 4-Inch PVC. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 2 WAY CONDUIT – 5-INCH FIBERGLASS (All Depths), Item 620 074 – The unit of measure for the Installation of Pepco Furnished 2 Way Conduit – 5-Inch Fiberglass including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 2 Way Conduit – 5-Inch Fiberglass. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 4 WAY CONDUIT – 5-INCH FIBERGLASS (All Depths), Item 620 076 – The unit of measure for the Installation of Pepco Furnished 4 Way Conduit – 5-Inch Fiberglass including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 4 Way Conduit – 5-Inch Fiberglass. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 6 WAY CONDUIT – 5-INCH FIBERGLASS (All Depths), Item 620 077 – The unit of measure for the Installation of Pepco Furnished 6 Way Conduit – 5-Inch Fiberglass including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 6 Way Conduit – 5-Inch Fiberglass. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement, equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

INSTALL 8 WAY CONDUIT – 5-INCH FIBERGLASS (All Depths), Item 620 075 – The unit of measure for the Installation of Pepco Furnished 8 Way Conduit – 5-Inch Fiberglass including base spacers, intermediate spacers, couplings, parts, and other items will be per Linear Foot (LF). Payment will be made at the contract unit price for the Installation of Pepco Furnished 8 Way Conduit – 5-Inch Fiberglass. Payment will include all labor, tools, Contractor furnished concrete for duct bank encasement,

equipment, ductbank complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

(G) INSTALL 2-WAY CONCRETE ENCASED FIBERGLASS DUCTBANK W/DUAL POLE BENDS, Item 620 078

1. DESCRIPTION – The work shall consist of installing Pepco furnished fiberglass conduit, spacers and other related items comprising the 2-way concrete encased ductbanks with dual pole bend assemblies running from the Pepco structural facility to the pole riser assemblies as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental materials, and equipment necessary for the installation of Pepco furnished conduits, complete and associated component parts.

Pepco furnished materials to be installed by the Contractor shall include the fiberglass conduits, fiberglass conduit sweep bends, spacers, couplings, precast concrete collars and other incidental items.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished fiberglass conduit and other required items from the Benning Stores facility to the project site.

The conduits shall be set to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

The maximum depth of excavation for the installation of the ductbanks connecting the Pepco facility to the pole riser assemblies shall be 6’-0”.

2. MEASUREMENT AND PAYMENT

The unit of measure for the Installation of a Pepco Furnished 2-Way Concrete Encased Fiberglass Duct Banks w/Dual Pole Bends will be per Linear Foot (LF). Payment will be made at the contract Linear Foot (LF) price for the Installation of Pepco Furnished 2-Way Concrete Encased Fiberglass Duct banks w/Dual Pole Bends. Payment will include all labor, tools, Contractor furnished concrete, equipment, with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

(H) PEPCO FURNISHED TAPHOLE INSTALLATION, Item 620 081

1. DESCRIPTION – The work shall consist of installing Pepco furnished precast concrete tapholes, precast tops, hatches, hardware, and other related items as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental

materials, and equipment necessary the installation of Pepco furnished precast taphole, complete and associated parts and components.

Pepco furnished materials to be installed by the Contractor shall include pre-cast taphole bases and top slabs (roof), hatches, covers and other component items.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished precast tapholes and other required items from the Benning Stores facility to the project site.

The Contractor shall verify the exact location of the tapholes in the field prior to starting any demolition or excavation work. The taphole shall be set to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

The manhole adjusting ring is not used in sidewalks where finished grade is established.

The maximum depth of excavation for the installation of a taphole shall be 6'-0".

2. MEASUREMENT AND PAYMENT

INSTALL A PRECAST TAPHOLE (3.5' (L) X 3.5' (W) X 4.0' (H), Item 620 081 - The unit of measure for the Installation of a Pepco Furnished Precast Taphole (3.5' x 3.5' X 4.0') and associated covers/tops, Bilco type hatches, and other items will be per each (EA). Payment will be made at the contract unit price for the Installation of a Pepco Furnished Taphole (3.5' x 3.5' x 4.0'). Payment will include all labor, tools, Contractor furnished materials, equipment, taphole complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

(l) PEPCO FURNISHED CONCRETE WELL CASING INSTALLATION, Item 620 082

1. DESCRIPTION – The work shall consist of installing Pepco furnished precast concrete well casings, precast frames, grating, hardware, and other related items as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental materials, and equipment necessary for the installation of Pepco furnished precast well casing, complete and associated parts and components.

Pepco furnished materials to be installed by the Contractor shall include pre-cast well casing, frame, grating, tamper shield and chimney baffle, rods, clamps and other incidental items.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished precast well casings and other required items from the Benning Stores facility to the project site.

The Contractor shall verify the exact location of the well casings in the field prior to starting any demolition or excavation work. The well casing shall be set to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

The maximum depth of excavation for the installation of a well casing shall be 7'-0".

2. MEASUREMENT AND PAYMENT

INSTALL A PRECAST CONCRETE WELL CASING (3.5' I.D. X 6.5' H), Item 620 082 – The unit of measure for the Installation of a Pepco Furnished Precast Well Casing (3.5' I.D. X 6.5' H) and associated covers/tops, grates, rods, clamps, concrete block and other items will be per each (EA). Payment will be made at the contract unit price for the Installation of a Pepco Furnished Well Casing (3.5' I.D. x 6.5' H). Payment will include all labor, tools, Contractor furnished materials, equipment, well casing complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

(J) INSTALL 2-WAY CONCRETE ENCASED PVC DUCTBANK W/DUAL POLE BENDS, Item 620 084

1. DESCRIPTION – The work shall consist of installing Pepco furnished PVC conduit, spacers and other related items comprising the 2-way concrete encased ductbanks with dual pole bend assemblies running from the Pepco structural facility to the pole riser assemblies as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental materials, and equipment necessary for the installation of Pepco furnished conduits, complete and associated component parts.

Pepco furnished materials to be installed by the Contractor shall include the PVC conduits, PVC conduit sweep bends, spacers, couplings, precast concrete collars and other incidental items.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished PVC conduit and other required items from the Benning Stores facility to the project site.

The conduits shall be set to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

The maximum depth of excavation for the installation of the ductbanks connecting the Pepco facility to the pole riser assemblies shall be 6'-0".

2. MEASUREMENT AND PAYMENT

The unit of measure for the Installation of a Pepco Furnished 2-Way Concrete Encased PVC Duct Banks w/Dual Pole Bends from Well Casings to Riser Connection Assemblies and other items will be per Linear Foot (LF). Payment will be made at the contract linear foot price for the Installation of Pepco Furnished 2-Way Concrete Encased PVC Duct banks w/Dual Pole Bends from Well Casings to Riser Connection Assemblies. Payment will include all labor, tools, Contractor furnished concrete, equipment, with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

(K) PEPCO FURNISHED ELECTRIC SPLICE BOX INSTALLATION, Item 620 092

1. DESCRIPTION – The work shall consist of installing Pepco furnished fiberglass splice boxes, splice box covers and other related items as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental materials, and equipment necessary for the installation of Pepco furnished fiberglass splice box, complete and associated parts and components.

Pepco furnished materials to be installed by the Contractor shall include fiberglass splice box, box cover, rods, clamps and other incidental items.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished fiberglass splice boxes and other required items from the Benning Stores facility to the project site.

The Contractor shall verify the exact location of the splice boxes in the field prior to starting any demolition or excavation work. The splice box shall be set to the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

The maximum depth of excavation for the installation of a splice box shall be 36".

2. MEASUREMENT AND PAYMENT

INSTALL PEPCO FURNISHED FIBERGLASS STREET LIGHT SPLICE BOX (13" W X 24" D X 24" H), Item 620 092 – The unit of measure for the Installation of a Pepco Furnished Fiberglass Street Light Splice Box (13" W X 24" D X 24" H) and

associated covers/tops, rods, clamps, and other items will be per each (EA). Payment will be made at the contract unit price For the Installation of a Pepco Furnished Fiberglass Street Light Splice Box (13" W X 24" D X 24" H). Payment will include all labor, tools, Contractor furnished materials, equipment, splice box complete with all Pepco supplied parts and components installed and all incidentals necessary to complete the Work.

(L) PEPCO FURNISHED PAD MOUNTED TRANSFORMER BASE INSTALLATION, Item 620 094

1. DESCRIPTION – The work shall consist of installing Pepco furnished precast concrete or fiberglass pad mounted transformer base, hardware, and other related items as shown on the Contract Drawings. The Contractor shall furnish all labor, tools, incidental materials, the installation of Pepco furnished transformer pad, complete in place.

Pepco furnished materials to be installed by the Contractor shall include pre-cast transformer pad, grounding cable and other component parts.

The Contractor shall be responsible for picking-up, loading, and transporting Pepco furnished precast transformer pad and other required items from the Benning Stores facility to the project site.

The Contractor shall verify the exact location of the transformer pad in the field prior to starting any clearing and grading work. The transformer base shall be set level at the required grade. Existing pavement and sidewalk areas to be removed shall be saw cut to create a clean, neat edge.

The maximum depth of excavation for a precast pad mounted transformer base is 1'-6" for the concrete pad and 3'-6" for the fiberglass pad mounted transformer base.

2. MEASUREMENT AND PAYMENT

INSTALL A FIBERGLASS PAD MOUNTED TRANSFORMER BASE (4'-3" X 4'-8"), Item 620 094 – The unit of measure for the Installation of a Pepco Furnished Fiberglass Pad Mounted Transformer Base and associated other items will be per each (EA). Payment will be made at the contract unit price For the Installation of a Pepco Furnished Pad Mounted Transformer Base. Payment will include all labor, tools, Contractor furnished materials, equipment, and all incidentals necessary to complete the Work.